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COMPUTERWORLD

Net management matures

Distributed enterprisewide support becomes a reality

By Stephen P. Klett Jr.

At long last, networking vendors are starting to make good on stale promises to deliver cost-effective distributed management capabilities.

Today, for example, Cabletron Systems, Inc. in Rochester, N.H., will unveil support for distributed management in the third iteration of its object-oriented enterprise management platform, Spectrum 3.0, which will ship in July. Spectrum uses artificial intelligence to distribute management capabilities across multiple servers throughout the enterprise.

LAN management growth

	1992	1993
Total worldwide installed base (units)	17,820	33,530

PERCENTAGE OF WORLDWIDE INSTALLED BASE

SunConnect SunNet Manager	40.7%	35.9%
Hewlett-Packard OpenView	20.5%	22.5%
NetLabs NetLabs Manager	8.5%	9.0%
Cabletron Spectrum	6.3%	7.4%
IBM NetView	1.8%	4.1%
Other	22.2%	21.1%

Source: International Data Corp., Framingham, Mass.

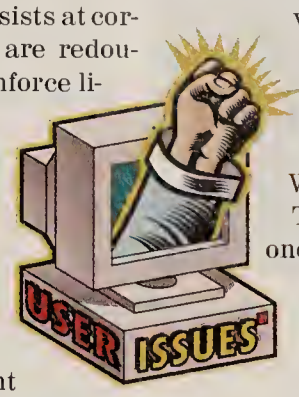
Rival systems

Last week, Tivoli Systems, Inc. announced that it will deliver similar capabilities in its Tivoli Management Environment Version 2.0, which will ship in the third quarter [CW, April 11].

Net management, *page 16*

Licensing stymies users

By William Brandel



As software piracy persists at corporate sites, vendors are redoubling their efforts to enforce license compliance. But users trying to comply say they are frustrated by the software community's lack of guidance and paucity of tools.

The recent high-profile bust of a student at MIT in Cambridge, Mass., underscores that software vendors will not tolerate illegal copying of their products. Piracy costs vendors billions of dollars a year worldwide — almost $1.6 billion in the U.S. alone, according to the Software Publishers Association in Washington.

The SPA estimates that one-third of all software in the U.S. is pirated, and that 95% of those thefts take place at corporate sites. It contends that less than 5% occur on bulletin boards or in aca-

Licensing, *page 12*

Hyatt offers IS guns for hire

By Ellis Booker
CHICAGO

Direct competitors may be reluctant to give Hyatt access to their strategic reservation systems.

Hyatt Corp. made news four years ago when it became the first major hotelier to move its central reservation system to a Unix platform running a relational database. Last week, the Chicago-based hotel giant again took the lead, spinning off its information systems group to market its systems and services to other hospitality companies.

"This was always something we planned on doing," said John Biggs, previously senior vice president of hotel accounting and administration at Hyatt Hotels Corp. and now chief operating officer of the new division.

Hyatt formed the division, Regency Systems Solutions, Inc., after its negotiations to sell the operation to Houston-based BSG Consulting, Inc. broke off late last year. The RSS system, a customized version of Hyatt's Spirit reservation system, was tested in October and November and went live the first week of January.

Also disclosed last week was the company's

Hyatt, *page 14*

On-line strategies

IBM pitches single E-mail box for access

By Michael Fitzgerald
and Lynda Radosevich

■ A set of services and software soon to be announced by IBM will give business users a single electronic mailbox for accessing incompatible E-mail networks, on-line services and even voice mail and faxes.

Code-named In-Touch, the service is targeted at a range of users, from mobile professionals with personal digital assistants to deskbound workers with dumb terminals. IBM's goal is to give users seamless access to incompatible networks, enabling them to send messages to disparate E-mail systems, pagers and even cellular phone users. Alternatively, a user could configure In-Touch to poll another person via E-mail, fax, pager or telephone until it is able to connect.

Heavyweight competition

The service is also expected to become IBM's entry into the brewing battle to provide intelligent agent-driven, on-line personal and business services [CW, Dec. 20, 1993]. It will compete with AT&T's PersonaLink, announced in January, and with a joint AT&T/Lotus Development Corp. service as well as

IBM, *page14*

CHARLIE SAMUELS

ARCHITECTURAL DIGRESS

SEE MANAGEMENT PAGE 119.

At a time when IS architecture should be more important than ever, daily pressures make it tougher than ever to craft and carry out distributed computing plans. First Boston's **Jim Swanson** and others carry on.

The Microsoft investigation

Users hold key to antitrust battle

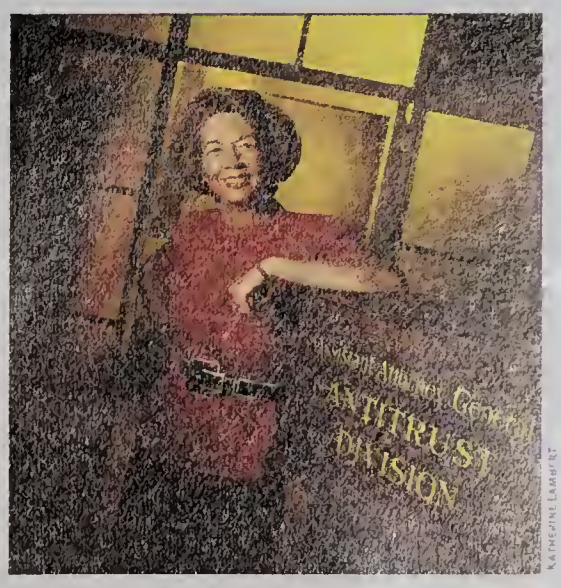
By Mitch Betts, Stuart J. Johnston
and Ed Scannell

As the U.S. Department of Justice enters another phase in the effort to chase down antitrust complaints against Microsoft Corp., the key issue that it must prove is whether Microsoft's business practices have harmed PC software buyers.

That point is critical because the U.S. Supreme Court has ruled that antitrust laws were designed to protect competition and consumer interests — not to settle feuds between competitors.

"The government has to show consumer injury," said Susan G. Braden, a Washington attorney who worked on the IBM antitrust

Antitrust, *page 30*



KATHERINE LAMBERT

The Antitrust Division's Anne K. Bingaman's *involvement suggests case won't fade away*

Newspaper

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IS managers are finding that laying the foundation for an information architecture is like trying to build on wetlands. Even the most carefully crafted plans will sink under executive indifference, skittish customers and cost-cutting demands. *Page 119*

The question of whether users are hurt by Microsoft's business practices goes right to the heart of the U.S. Department of Justice's antitrust probe, and users interviewed last week had mixed opinions of whether they may suffer damages from Microsoft's policies. *Page 1*

Hotelier Hyatt Corp. turns supplier, announcing it will spin off its IS group — which four years ago caught the public eye with a successful move to Unix — to market its systems and services to other hospitality chains. *Page 1*

Holiday Inn's client/server project stalls for the second time in 18 months as its vendor, Dun & Bradstreet Software, works to resolve performance problems for the hotel chain. *Page 59*

As Levi's undertakes a massive corporate re-engineering, could it be hanging Unix out to dry? The vintage San Francisco jeans maker has become tight with Microsoft. *Page 26*

New York's Metropolitan Museum of Art moves to smartsize formerly host-based applications using Microsoft's Windows NT and NT Advanced Server as core technology. *Page 57*

Smaller vendors may hold the answers to client/server challenges, as evidenced by several contracts awarded by user companies that chose lesser-known applications vendors. *Page 89*

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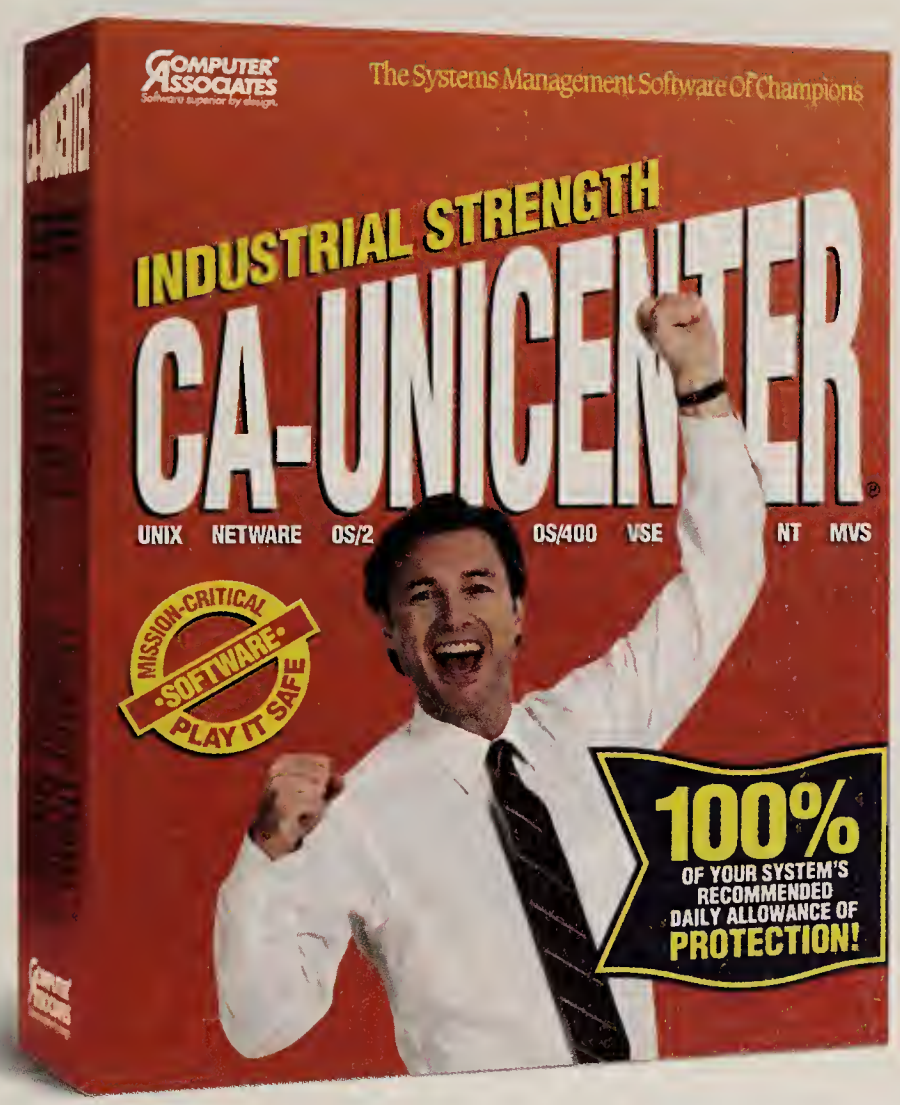

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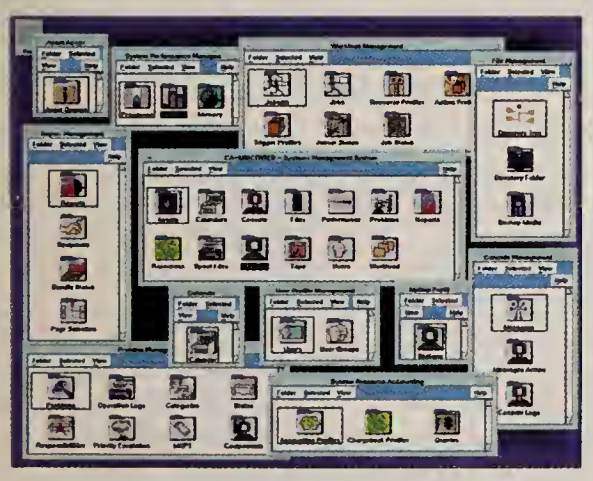

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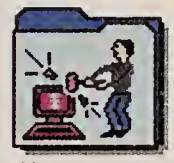

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DEC's $183M loss stuns industry

By Mary Brandel

Digital Equipment Corp. shocked and disappointed everyone from Chief Executive Officer Robert Palmer to the analyst community when it announced a $183 million loss last week.

As part of its third-quarter financial report, Digital reported losses of $1.34 per share; analysts were expecting a loss of roughly 32 cents per share.

Palmer conceded that "a critical dimension — profitability — is not succeeding."

Digital attributed the loss to poor product gross margins, down 10 points from a year ago. That drop was caused by a shift to low-end sales and a "need to transition to a more competitive cost structure." Digital said it is likely to launch yet another major restructuring in fiscal 1995.

Stephen Smith, an analyst at Paine Webber, Inc. in New York, told Digital executives during a teleconference last Friday that increased spending on sales and administration compared with the second quarter "implies that expense controls aren't tight enough." Digital cited increased spending on advertising and marketing.

"The bad news is, Digital can't forecast," said Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass. "I'm pretty amazed that they didn't have more control over their cost structure."

Other analysts also expressed dismay.

"There's no way a company can raise or stabilize its margins as long as its 20% gross margin is growing faster than 45%," said William J. Milton Jr., an analyst at Brown Brothers Harriman & Co. in New York.

Digital said a second major factor was a faster-than-expected decline in VAX maintenance contracts, a shortfall that consulting services failed to pick up. Service revenue was down 11% from a year ago, to $1.5 billion.

The good news was that total revenue was in line with most analysts' expectations — down 6% from a year ago but relatively flat with the second quarter this year.

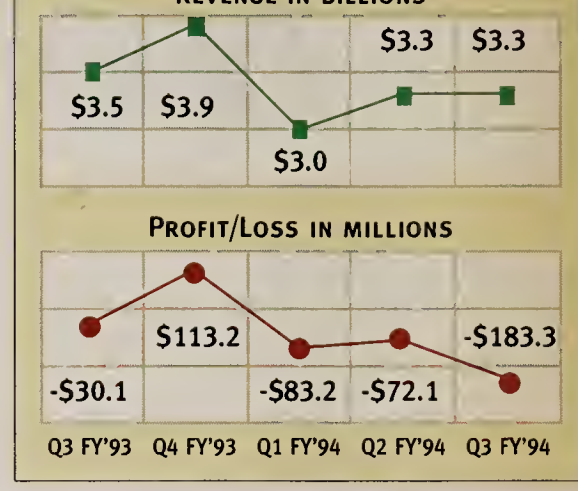
"Workstations have doubled quarter over quarter," Palmer said. "Alpha is now 27% of total system revenue. Excluding PCs, Alpha represents 50% of systems revenue and is almost equivalent to the VAX."

Digital is seeing rapid growth in units and revenue of storage and PC products, he added.

Although the company was careful not to make promises for profitability in the fourth quarter, Palmer said he believed Digital would see revenue growth over the current quarter. "There's no excuse for not succeeding."

More bad news

Higher costs and lower margins widened Digital's losses in the third quarter



DEC hits all the right notes with new server

By Mary Brandel

Digital Equipment Corp. hit a high note with users and analysts with the long-awaited debut this week of an Alpha AXP symmetrical multiprocessing server, the 2100 Server Model A500MP.

Digital is positioning this four-processor system as a database/application server, a PC LAN server, a mainframe downsizing platform and a technical computing machine. The new box is taking aim at both the PC superserver market and its mid-range Unix competitors. The 2100 is based on Digital's 21064 190-MHz CPU and supports Microsoft Corp.'s Windows NT Advanced Server, OSF/1 and OpenVMS.

Comparing the competitors

With its new multiprocessor server, Digital seeks to provide the performance and expandability of a large system with the cost of a small system

	Digital 2100 server Model A500MP	Compaq ProLiant 4000	HP HP 9000 H60
Number of processors	1 to 4	1 to 4	1
Maximum memory	2G bytes	512M bytes	768M bytes
Starting price	$18,900 (NT) $26,900 (Unix)	$16,600	$76,000

Super-fast applause

Nearly everyone has applauded the machine's price and super-fast speeds. The 2100 "is cheap, it's fast, it's scalable, and it should run a database like a bandit," said Rob Tholemeier, an analyst at Meta Group, Inc. in Westport, Conn.

"It beats the pants off all of the Unix competitors," said Terry Shannon, an analyst at Illuminata in Hollis, N.H. He likened the debut to that of the MicroVAX II.

"It would be great to have one system I could load up with either [NT or OpenVMS]. That kind of flexibility warms my little heart," said Robert Cloninger, data processing manager at OK Industries, Inc. in Fort Smith, Ark. Cloninger runs production applications under VMS on non-Alpha machines but is beginning to use NT Advanced Server for his network servers.

"We were waiting for such a box to come out," said Gary Mauler, a systems engineer at Westinghouse Electric Corp. Mauler said he needed a host with heavy horsepower to support an NT-based wireless message-switching hub being built by Westinghouse.

Mauler is also considering servers from Compaq Computer Corp., AT&T Global Information Solutions (the former NCR Corp.) and Dell Computer Corp. A drawback to an Alpha-based system, is that "some of the tools we're using only run on Intel, which could cause performance issues," he said.

The server will also cause ripples in Digital's current Alpha lineup, diminishing the need for certain models and simplifying the current product line, Shannon said.

The 2100 also signifies some substantial manufacturing efficiencies, made possible in part by using the Peripheral Component Interconnect bus, a fast, inexpensive bus that is rapidly becoming an industry standard in the PC world. Digital can now standardize on this one modular server platform to create future workstations, PCs or higher-power servers.

"Instead of having different packages for the Unix and PC markets, this subsumes the bus structures into one design," said Lynn Berg, an analyst at Gartner Group, Inc.

Among the accolades, however, some lower chords were struck. One question is whether Digital is nimble enough to keep pace in the race it has entered by directly targeting Compaq's ProLiant line with its starting price of $18,900 for NT versions.

Cheaper, faster, better is key

In that market, "you have to provide improvements on a six- to nine-month basis," said Jonathan Eunice, an analyst at Illuminata. "You don't come out with cheaper, faster, better every two years or you won't be in the market much longer."

"People want more than a good computer," Tholemeier said. "They want their hands held" as they move to open, server-based environments. "Digital has the talent. They just don't have the program."

"This will require an unusual amount of aggressiveness on the part of the DEC sales force," added Wes Melling, an analyst at Gartner Group. "There are a lot of enterprises that refuse to talk to DEC anymore."

Yet in terms of product offerings, most agree that the company is now on very firm ground. "Digital is offering extremely powerful computers for a very low price," Tholemeier said.

"This is where the next major price erosion is going to happen. By the end of the year, we'll be seeing $30,000 servers that today would cost $100,000," he said.

Bits and bytes

Key pieces of the Digital announcement included the following:

- Pricing deals on 2100 Series systems preconfigured with Oracle Corp., Sybase, Inc., The ASK Group, Inc.'s Ingres or Microsoft Corp. SQL Server databases through December. Also, a prepackaged configuration of the 2100 for technical developers, priced at $15,140.
- More than 5,000 applications now shipping for Alpha, including 500 for Windows NT and 2,300 each for OSF/1 and OpenVMS.
- Availability of OSF/1 Version 3.0 in July, including symmetrical multiprocessing support for up to six processors.
- Availability of OpenVMS 6.1 in May, including functionality equivalent to OpenVMS running on a VAX. Customers can expect the same clustering, data integrity, multivendor integration and other such features on either platform.
- Enhancements for OpenVMS within the next 18 months that include a log-structured file system to increase transaction processing performance and PC file compatibility.
- A beta version of Microsoft's Daytona operating system on 2100 Models A500MP and A600MP early ship program.

Correction

"Unicenter disappoints" [CW, April 4] omitted the following paragraph: Computer Associates International, Inc. executives insist the revenue stream has met their expectations. "We've been substantially — but not spectacularly — ahead of those targets" set for Unicenter revenue last year, said Alan Paller, CA's director of open systems, referring to CA's internal targets. He declined to disclose CA-Unicenter unit shipments and revenue.

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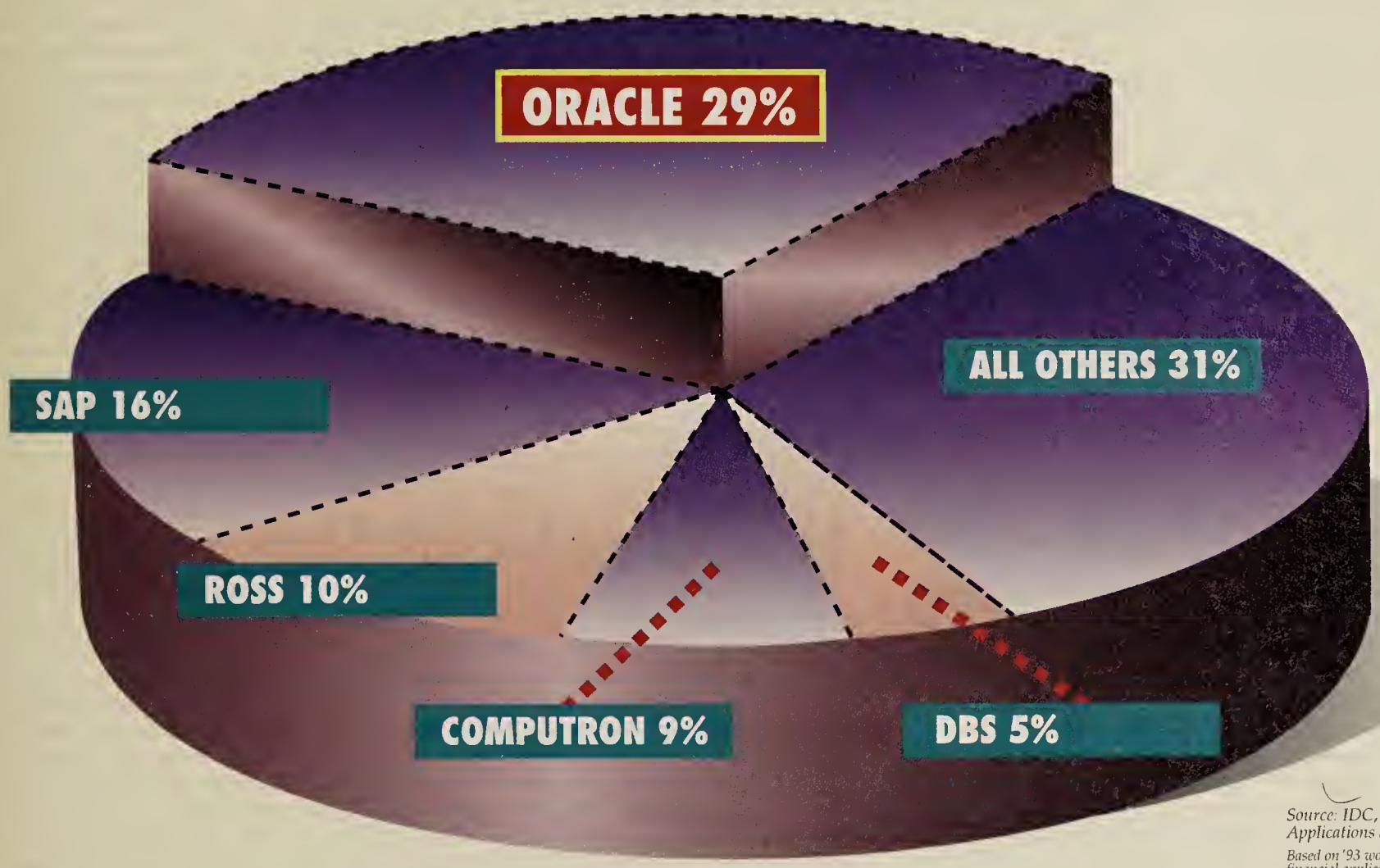

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Based on '93 worldwide client/server financial applications revenue.

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Jobs: A man with a mission

Steve Jobs, who nearly disappeared from view when Next Computer ran into trouble, is back.

His public appearances suddenly outnumber the blossoms on a spring azalea. He appeared at the Oracle user group meeting in Burlingame, Calif., two weeks ago. He opened his doors, which he used to keep locked to the computer press. He sat quietly in the front row of the audience as Sun CEO Scott McNealy held a press conference with a row of lieutenants at the SunSoft Developers Conference in San Francisco. Jobs attracted a crowd afterward as he spoke with animation about the alliance of Next and Sun.

You get the impression Jobs is no longer fussy about where or with whom he appears. Granted, the relationship between Next and Sun is crucial to both companies. Sun was working hard on the plumbing for its Distributed Object Environment when it found that it still needed to put high-level tools and a development environment on top of it. NextStep just happened to be sitting a short distance up Route 101 in Redwood City, Calif.

Jobs took the SunSoft stage two days later to explain how the alliance came about: "We were both in the hardware business so we flipped a coin. I lost, so I had to get out." Executives of small, struggling companies couldn't walk away from failures like that, but Jobs drew a big laugh from the 2,000 assembled developers.

The Meta View

It is clear that Jobs is once again a man with a mission.

Charles Babcock

Jobs has a knack for playing on the monumental ups and downs he has been through, and his offhand manner does nothing to dispel his status as a quasi-industry legend. It's just one more element that he works into the presentation.

It's clear that Jobs is once again a man with a mission. But he's no longer trying to change the world with a fantastic new computer. Rather, he's trying to save corporate IS from the application backlog. "That cliche?" you say. Yes, the application backlog.

The only way out of the software morass, which gets worse as you move toward client/server, is objects, Jobs asserts. He is not the only one saying this, but he says it with surprising skill and conviction.

He may be lost behind a balance sheet, but on stage he focuses his attention on the message, delivering rapid-fire lines and creating suspense as he tries to do something at the keyboard, all the while castigating the competition. It is a flawless presentation and it captivates a technical crowd.

Behind the show is a number of real-world developments. Sun and Next need each other as strategic partners. Sun, which has lost some of its edge in hardware, has a large software development customer base, and Next is one of the few object development environments available.

Sun has been an advocate of open standards, and NextStep has been a strong proprietary system. Sun urged Next to open up. "I resisted," Jobs said. But Next plans to publish NextStep APIs by June 30 and add standard CORBA support. Soon it will offer a hardware-independent version, OpenStep, for Sun's Solaris.

His old desire to be an agent of change has reasserted itself at a time when much of the industry, faced with a Microsoft juggernaut, is looking for a rallying point. Next appears ready to round up several key Unix players, having already achieved ties to Sun and Hewlett-Packard, with a pending announcement that concerns OSF/1.

And Jobs is starting to get some shipment numbers on his side. But it is also clear that the real fire in the object evangelist is not the application backlog but the prospect that the solution to it may come only from Microsoft.

"We want to get to that upper [object development] layer before Microsoft does," he says. And he thinks he has the tools to do it.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Intel gets competition

IBM agrees to build Cyrix chips, gains sale rights

By Michael Fitzgerald and Jaikumar Vijayan

Competitors continue to chip away at Intel Corp.'s monolithic dominance of the microprocessor market, but they will not do any structural damage for some time yet, analysts said.

The latest assault came last week when Cyrix Corp. announced that IBM's Microelectronics Division will build its 486 and future processors. Cyrix has had problems supplying customers because it has not had a chip fabricator to produce its chip designs.

In addition to a customer for its fabricator capacity, IBM gains a 486-compatible microprocessor that it can sell on the open market, something it could not do with its manufacturing rights for Intel processors. IBM has already shifted most of its development talent from its Blue Lightning series of processors to PowerPC development efforts, internal sources say, so the Cyrix deal will give it a solid entry into the Intel-compatible market.

Letting go

IBM recently gave up its right to build Intel's Pentium chip. IBM, which uses a CMOS process technology to build chips, would have had to invest hundreds of millions of dollars to accommodate the Bi-CMOS process used to make Pentium. Also, it would not have had rights to sell the chips in the merchant market.

In return, analysts said they expect IBM's manufacturing muscle will give Cyrix a great boost, and over time could lead to lower prices in the chip market. It is not clear, however, whether this will lead to dramatic price cuts in system costs because of the low margins in the systems business.

Other analysts, however, suggested that Intel has nothing to fear for a while because of the time required to ramp up production and the fact that Cyrix's Pentium-killer, the M1, is still unproved.

Charles Boucher, an analyst at Hambrecht & Quist, Inc. in San Francisco, said Intel's current lead was as locked up as molasses in January, "but eventually it'll be June, and the molasses will flow." Boucher said even with IBM, Cyrix and other competitors will not likely harm Intel's sales and earnings growth until late 1995.

Lotus backs off Mac app market

By William Brandel

In what it called a straightforward investment decision, Lotus Development Corp. decided to yield the Macintosh application market to Microsoft Corp.

Lotus officials last week confirmed they will not develop personal productivity applications for Apple Computer, Inc.'s version of the PowerPC, the Power Macintosh. The company also said it is no longer actively developing upgrades for its Macintosh-based spreadsheet application, 1-2-3 Version 1.1.

"It was an opportunity vs. cost decision," said Jeffrey Beir, vice president of Lotus' spreadsheet and database division. "People are moving toward Windows and OS/2, but we don't see much opportunity on Apple's Power Macintosh. It was a matter of where are our resource dollars best spent, and that is Windows and OS/2."

Continued support

Lotus said it would continue development on its CC:Mail and Notes products to ensure they run on the Macintosh and Power Macintosh clients. The company also said it would continue to support its 1-2-3 spreadsheet on the Macintosh.

Citing disappointment with the Lotus decision, a spokeswoman at Apple said 50 applications are now available for the Power Macintosh and 150 applications have been promised. She said she did not know how many were personal productivity applications.

Lotus' decision to avoid the new Apple platform does not indicate any further erosion of support for the Power Macintosh. WordPerfect Corp. and Microsoft are backing the platform. WordPerfect is shipping WordPerfect for the Power Macintosh and has committed to porting its Office messaging product as well.

Microsoft said it would begin shipping new versions of its Office suite and that a version of Works for the Macintosh would be delivered this summer. The company said it is still committed to delivering Power Macintosh versions of these products.

Lotus' decision to withdraw from the Macintosh personal productivity market tightens Microsoft's overwhelming hold on the Macintosh business applications market. Analysts noted that Lotus never delivered a word processor for the Apple environment.

Not worth fighting for

Even though the PowerPC application market is projected to double, Lotus is stepping out of the ring

Product	1994 worldwide shipments	1994 worldwide revenue	1995 worldwide shipments	1995 worldwide revenue
PowerPC spreadsheets	181,000	$38M	428,000	$81M
Total PowerPC applications	1.09M	$167M	2.73M	$358M

Source: Dataquest, Inc., San Jose, Calif.

In the one area where Lotus and Microsoft squared off on the Macintosh — spreadsheets — Microsoft held an 85% market share, said Michael Geran, an analyst at Pershing Division, a Wall Street investment concern and division of Donaldson, Lufkin & Jenrette Securities Corp. Lotus held an 11% share, he noted.

Geran said Lotus' withdrawal from the Apple personal productivity applications market should not have a negative effect on the future of the Power Macintosh.

"In the Apple market, one spreadsheet is enough," he said. "It doesn't have to be the best."

Notes yields high returns but issues linger

By Lynda Radosevich

Notes users are seeing a significant return on their investment, according to a recent study of Lotus Development Corp.'s groupware package.

Users contacted last week agreed that Notes is helping their organizations, but some said they are disappointed with various technical components, including a recently released server version for Novell, Inc.'s NetWare.

"To our users, Notes is the hottest thing since sliced bread, and it does fill a niche. But it really isn't good for many things because of its limited architecture," said Joseph Awe, an information systems manager at SmithKline Beecham PLC in Philadelphia.

Quick payback
In extensive interviews at 50 Notes sites, IDC found more than 60% saw a payback in less than three years.

Notes is good at improving the bottom line, however. Fifty companies using Notes saw a payback in an average of 2.4 years and an average return on investment of 179% in three years, according to a study by International Data Corp. (IDC) in Framingham, Mass. Lotus paid for the study and supplied customer lists but did not influence its results, according to its authors.

The three-year return on investment for Notes applications ranged from 16% to 1,666% on an average investment of $240,000. Because of the payback and less tangible benefits such as developing an electronic corporate memory, "most users were very forgiving of Notes' failings," said Ann Palermo, co-author of the report.

The payback was largely attributed to time saved completing projects and solving problems. The time savings stemmed from information being easier to access and share. In some cases, the payback was due to fewer mainframe cycles being used, the authors said.

"I think these figures are conservative on the part of IDC," said David Ferris, president of Ferris Networks, a consultancy in San Francisco. He added that while he has seen Notes sites log in even higher returns than IDC reported, "there are a lot of database applications that give high returns, and it's perfectly normal that one would expect an investment in computers to deliver a return."

But while Notes sites are seeing what Ferris and others called a reasonable return on their investment, some said Lotus is falling short of promised technological improvements. For example, a Notes version that runs as a Novell NetWare Loadable Module (NLM) would "run faster than a scalded dog," a Lotus official promised at the product's announcement late last year.

But "we haven't seen a major performance increase, and we're very disappointed," said Don Hampton, a network director at Computer Language Research, Inc., a Carrollton, Texas, firm that participated in the study.

Notes' performance is a big issue in complex Notes applications, Hampton added. Others concurred. "Processing on the [NetWare] server is likely to be slower," said David Marshak, a vice president at Patricia Seybold Group in Boston.

The NLM version should be good at accessing files quickly, Marshak added. But he explained that in processor-intensive procedures, such as indexing databases, OS/2, Unix and Microsoft Corp.'s Windows NT are likely to be superior Notes performers.

In preliminary Lotus tests, Notes running on a dedicated NetWare server significantly outperformed the OS/2 version. But when tested with other applications running on the same server, the performance was comparable to the OS/2 version, conceded Mike Laginski, director of Notes product development.

Prerelease information from the IDC study had indicated that the Notes payback took much longer than the released report said [CW, Dec. 12, 1993].

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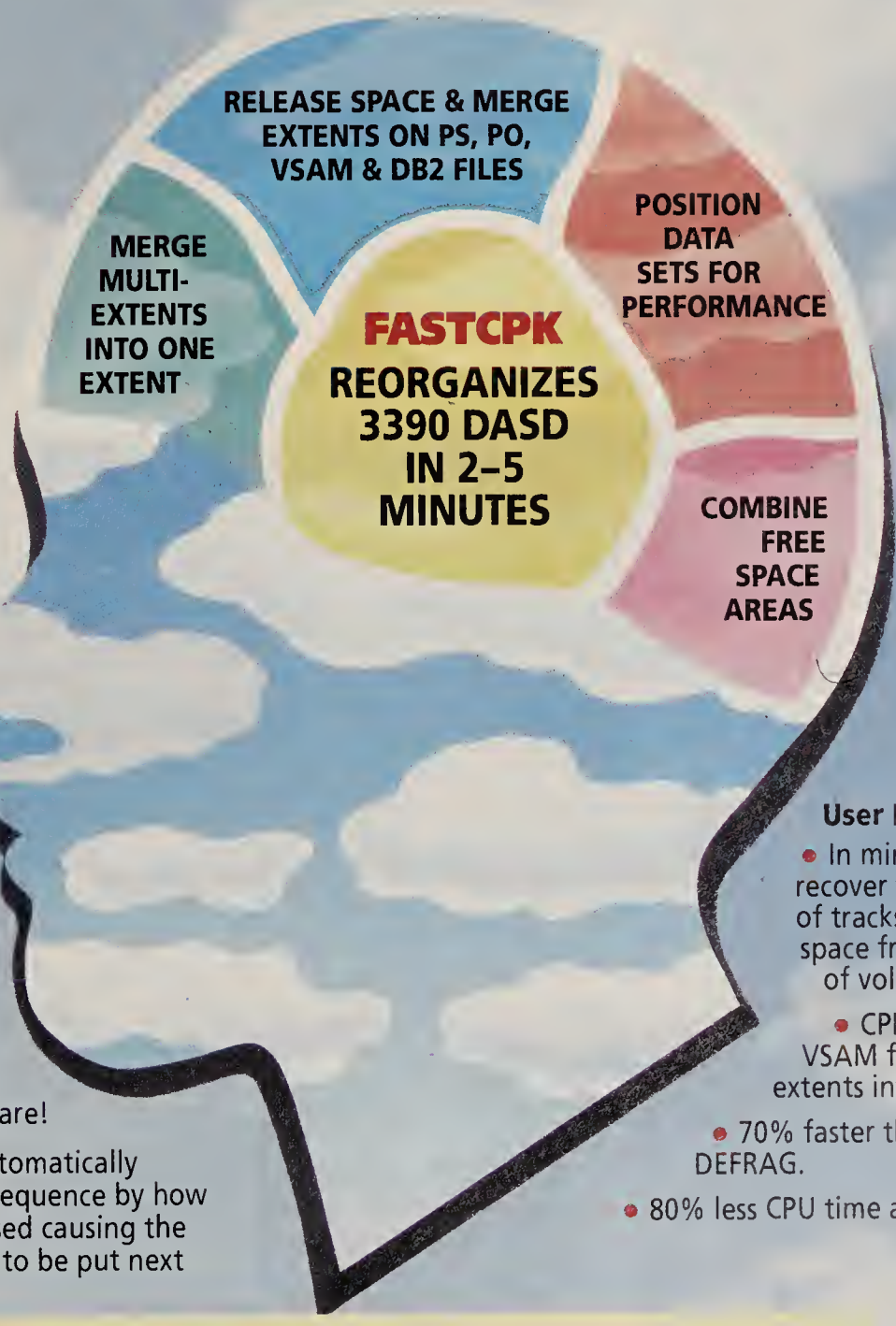

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  DEFRAG   DDNAME(DASD1
```

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Sybase/Microsoft split triggers user concerns

By Kim S. Nash

The formal division of SQL Server database duties between Sybase, Inc. and Microsoft Corp. has left several users on the cusp of Windows NT decisions wondering where to go from here.

Last week the vendors amended their 1987 technology-sharing pact, as expected [CW, April 4]. Now they will compete in the database market, with each building its own SQL Server.

Moreover, as part of the new deal, Sybase committed to putting System 10, the latest version of SQL Server, on Windows NT by the third quarter. Until now, Sybase was silent on plans for an NT port. Microsoft, meanwhile, will own and modify a previous edition of SQL Server, Release 4.2, on NT.

Still unknown is whether OS/2 users will see any enhancements from either Sybase or Microsoft. "We will look at OS/2 and decide" whether to port System 10 products to the operating system, said Bob Epstein, Sybase's chief technology officer. He declined to cite a time frame for the decision. Likewise, Microsoft has not committed to enhancing SQL Server for OS/2 like the NT version. For now, the existing SQL Server for OS/2 remains a shared product for both vendors to sell and support.

While both firms pledged continued compatibility for applications moving between the two database engines, several users said they were not convinced the promise is realistic.

The vendor split "makes migrating from low- to high-end databases a lot cloudier now that they will be going in different directions," said Ken Walpert, chief information officer at Kwasha Lipton, an insurance-related firm in Fort Lee, N.J.

Sybase System 10 includes several specialized add-on modules that Microsoft will not support. Among them is Replication Server for synchronizing databases at different sites.

Microsoft has already begun to add features to SQL Server 4.2 that play off some NT-specific capabilities, such as graphical systems administration processes. Microsoft also wants to better integrate SQL Server with its own products, such as Access and FoxPro, said Paul Maritz, Microsoft's senior vice president for systems.

Better-than-expected sales of SQL Server on Windows NT helped spur the split. For example, 15 of 60 major Sybase customers at a recent roundtable said they plan to use or have already started using NT, Epstein said. "One of the eye-opening things for Sybase has been the acceptance of the NT operating system" for SQL Server, he said.

Cause for concern

Microsoft has pushed NT hard as an alternative to Unix, Sybase's bread-and-butter platform. "Our intent is not to duplicate System 10 [but] to optimize SQL Server for tight integration with Microsoft's product line," Maritz said.

That has some users worried. "This puts the onus on us as developers to make sure we build applications exactly to their recommendations to see them smoothly compatible," said Pat Beehan, systems specialist at a large Texas oil company. Beehan wants to move 30 key programs from IBM OS/2 to NT during the next six months, but has not chosen a SQL Server provider.

For users who have already chosen between Sybase and Microsoft, price and technical support were deciding factors. In general, users noted that where Microsoft beats Sybase hands-down in database pricing, Sybase outshines Microsoft in the kind of technical attention corporate customers demand for enterprise-level projects.

Meanwhile, Sybase's tiered pricing, a tradition among relational database makers, repels some smaller users. An unlimited-user license for Microsoft SQL Server for NT costs $15,000 compared with upwards of $100,000 for an unlimited-user contract for Sybase SQL Server on Unix. Users must pay extra for Replication Server and other add-ons.

Sybase declined to specify pricing for forthcoming NT products.

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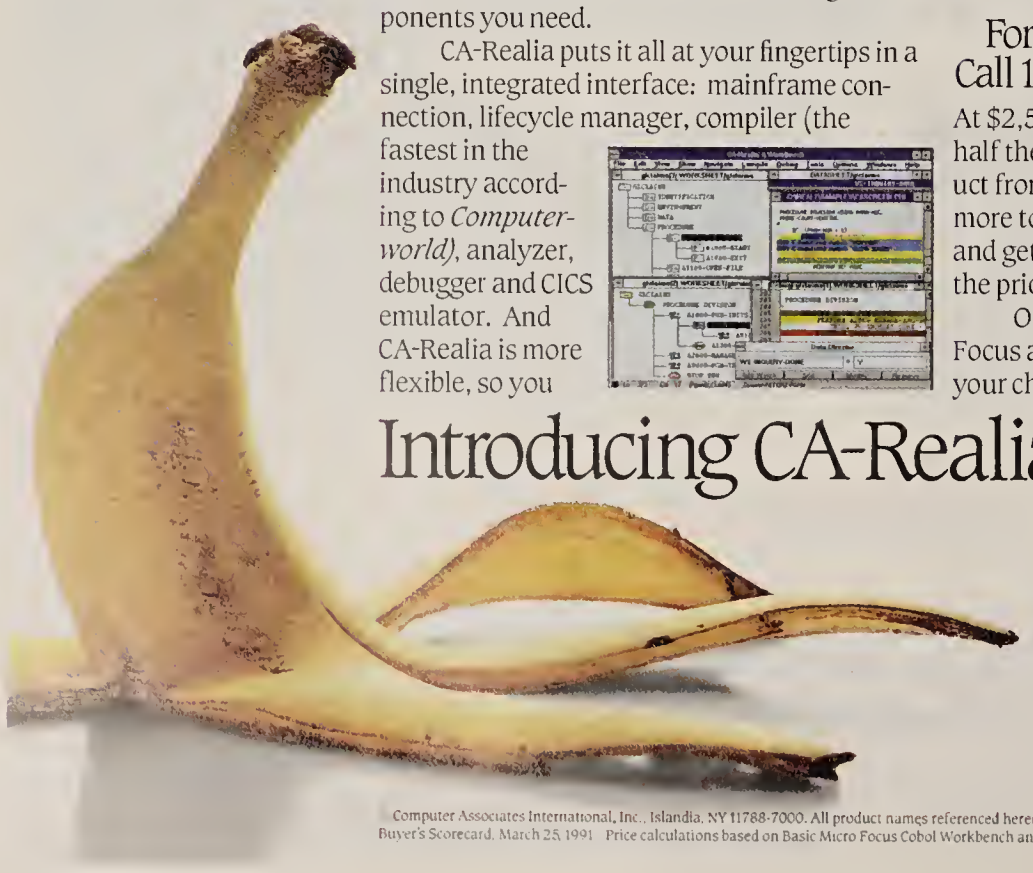

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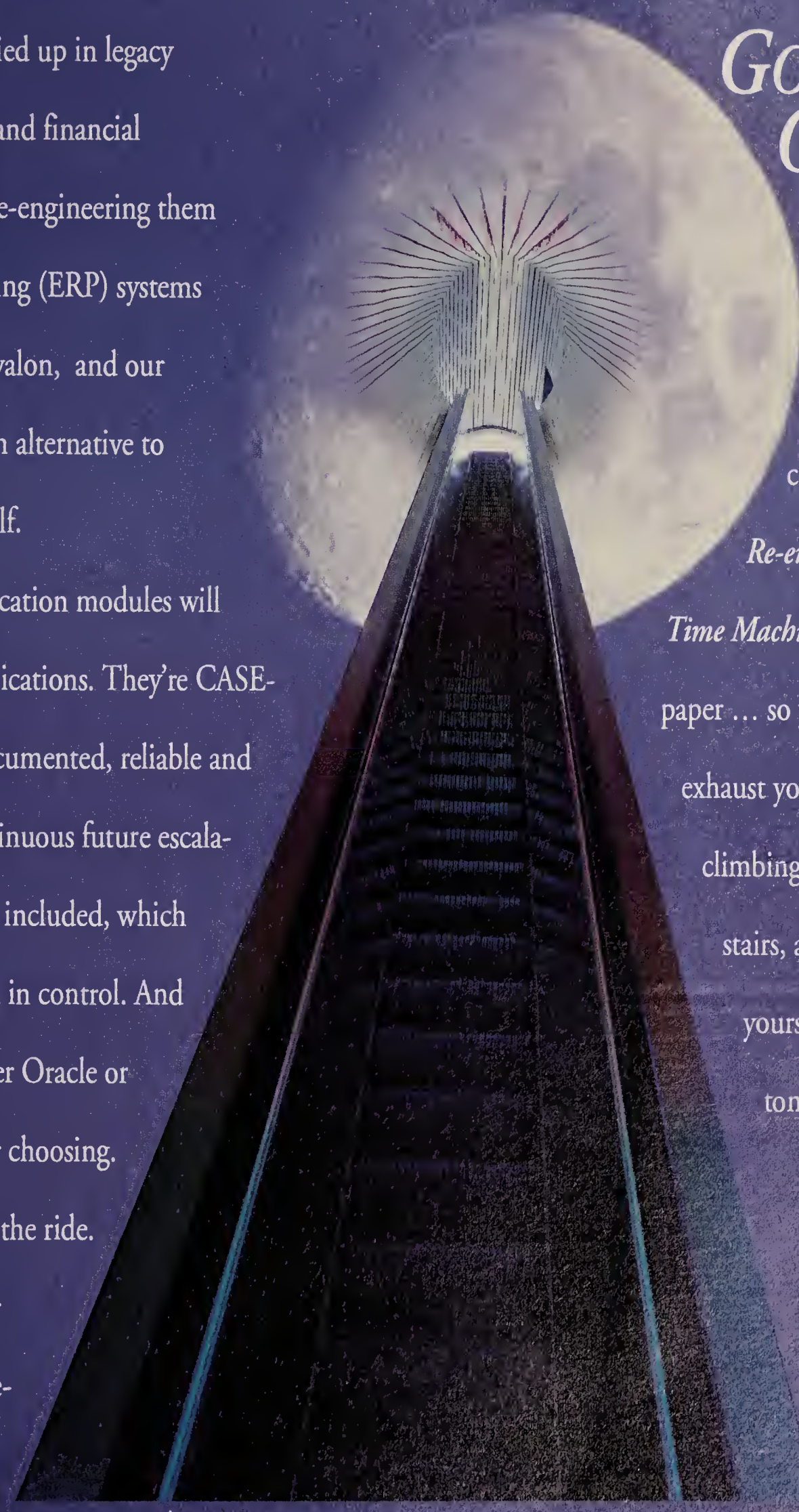

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News Shorts

Computerworld honored

For the second year in a row, *Computerworld* was named Best Computer Newspaper in the 100,000-plus circulation category at the Ninth Annual Computer Press Awards, held last week in New York. Computer trade and general business entries were evaluated across 22 categories by 64 judges. Winners in best article categories included *Computerworld* reporter Stuart Johnston for his work at *InfoWorld* last year with Doug Barney and Kevin Strehlo. Other technology and business publications awarded first-place honors included *Macworld*, *Electronic Buyers' News* and *Upside* magazine.

Small profit expected for IBM

Wall Street analysts expect **IBM** to chalk up its second straight profitable quarter when the company reports its financial results Thursday. However, the profit is likely to be small, with outside estimates ranging from $33 million to $82 million. Revenue is expected to come in between $12.7 billion and $12.8 billion, down slightly from the $13.1 billion for last year's first quarter, analysts said.

Europe seeks portability standard

X/Open Co. last week said it is launching a project with the European Community to establish a set of standards and testing tools for application portability in open systems. It said it hopes to pull in vendor support and will deliver various developer tools to participants. The joining fee for the two-year project is $50,000.

Oracle ships new Oracle 7

Oracle Corp. last week began shipping a version of the Oracle 7 database management system running on Novell, Inc.'s Unix System V Release 4-based platform. Called OracleWare System UnixWare Edition 1.0, the product starts at $5,095 for a five-user license.

Banyan adds support programs

Banyan Systems, Inc. last week announced two support programs for its Value Investment Protection customers. For prices starting at $795, the programs offer users the ability to call the vendor directly to resolve problems and to get on-line product releases and bug fixes, among other features.

Boole to get client/server tools

Trying to plug a hole in its client/server product line, **Boole & Babbage, Inc.** signed a letter of intent to acquire Unix-based systems administration software developed by Sysnet A.S. of Norway. Boole had been developing its own client/server tools, according to one executive, but decided the Sysnet purchase would be a faster way to provide the capabilities.

SHORT TAKES **Novell, Inc.** has announced software said to allow its Message Handling System to act as the common messaging transport system for any application written to Microsoft Corp.'s Simple Mail API, the X.400 API Common Messaging Calls or Lotus Development Corp.'s Vendor-Independent Messaging.... **IBM PC Co.** has finally reduced prices on its PS/2 Server 95 series by nearly 15% and expanded the distribution channels for its 85 and 95 server products to, among others, **Merisel, Inc.**, **Tech Data Corp.** and **Ingram Micro**.... **Data General Corp.** is offering Aviion customers a support program that provides 24-hour, seven-day hardware and software coverage and guarantees 99.5% uptime on the DG/UX operating system.... **Action Technologies, Inc.** said it is shipping its workflow software for Microsoft's SQL Server and Windows NT.

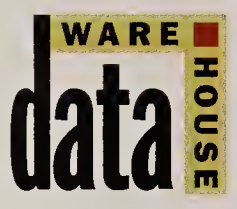
SAS used for data warehouse

New platforms, tools revive storage option

By Rosemary Cafasso
DALLAS

Although SAS Institute, Inc. is not a mainstream database vendor, many of its customers are using the SAS environment to create data warehouses that give users easier access to data.

Several customers at the annual SAS User Group International Conference held here last week said they are taking advantage of SAS software on Unix and other server platforms to set up end-user data warehouses for decision-support and other query applications.



Data warehousing, a concept that has its roots in mainframe computing, is re-emerging in many users' client/server strategies because the newer platforms make it a more economical and technically feasible option. Put simply, a data warehouse is a separate data store containing copies of useful and accessible production data.

SAS was launched in 1976 as a mainframe statistical software provider. Its core product, the SAS System, provides basic data management functions. It also offers several analysis and query tools that are tightly integrated with the SAS System.

The Cary, N.C., company is positioning this software as a warehouse platform because it provides data storage functions as well as end-user tools to access the data. In addition, SAS sells its software for numerous platforms, which allows mainframe customers to adopt SAS for smaller server platforms.

"We use the SAS System to deliver information, whereas before information was very inaccessible," said Andrew J. Lobb, a project manager at Harvard Community Health Plan in Brookline, Mass., which recently set up a SAS-based warehouse to provide patient information to physicians.

Big time
Privately held SAS reported approximately $420 million in revenue for 1993. It has about 3 million users at 26,661 user sites.

Other users said they are well-versed in the SAS tool set from their mainframe days and find it makes sense to use SAS software on server platforms, where they create end-user systems, rather than bring in new tools and database management systems.

Going to market

In many cases, users are downloading SAS mainframe data to the server platform for market analysis and other end-user functions.

Associates Commercial Corp., a financial services firm in Irving, Texas, completed such a project earlier this year.

Mark Bradley, vice president of strategic marketing, said the company installed the SAS System on a four-way Sun Microsystems, Inc. SPARCserver and receives monthly downloads from the mainframe SAS System. Bradley's group designed the new SAS software for end-user market analysis.

"When we moved to client/server, we wanted a quick migration and very little retraining," Bradley said. "With SAS, there was no conversion process."

SAS bills its software as "information delivery" tools. It designed the system to be ported to other platforms, and it currently runs on various Unix servers as well as IBM's OS/2 and Microsoft Corp.'s Windows NT.

However, industry analysts said that as SAS promotes the data warehouse concept, it may find it a tough sell beyond its existing customer base. While SAS software ties into other database environments, little effort has been made until recently to link other third-party tools into the SAS world.

Last week, the company confirmed that it will support Microsoft's Open Database Connectivity (ODBC) specification, which will allow third-party tools that support ODBC to access SAS data sets.

For many SAS users, however, the current lineup of SAS tools suits their warehousing needs. Still others said they hope to see more openness from their vendor.

"SAS [System] gives you the ability to hold data and have rapid access to it," said Robert Hall, a lead technical engineer at Computer Sciences Corp. in Rockville, Md. "It's wonderful, but it is limiting because so few things can read SAS data sets."

SAS 'InfoTaps' new market

SAS pumped up its line of data query and analysis tools last week at the annual SAS User Group International Conference in Dallas by announcing new functions and support for additional platforms.

Last week's rollout to approximately 3,000 attendees included InfoTap, an information search and retrieval tool that will initially be available for Hewlett-Packard Co. HP/UX Unix machines.

A second release, scheduled for later this month, will provide versions for IBM AIX and Sun Solaris platforms.

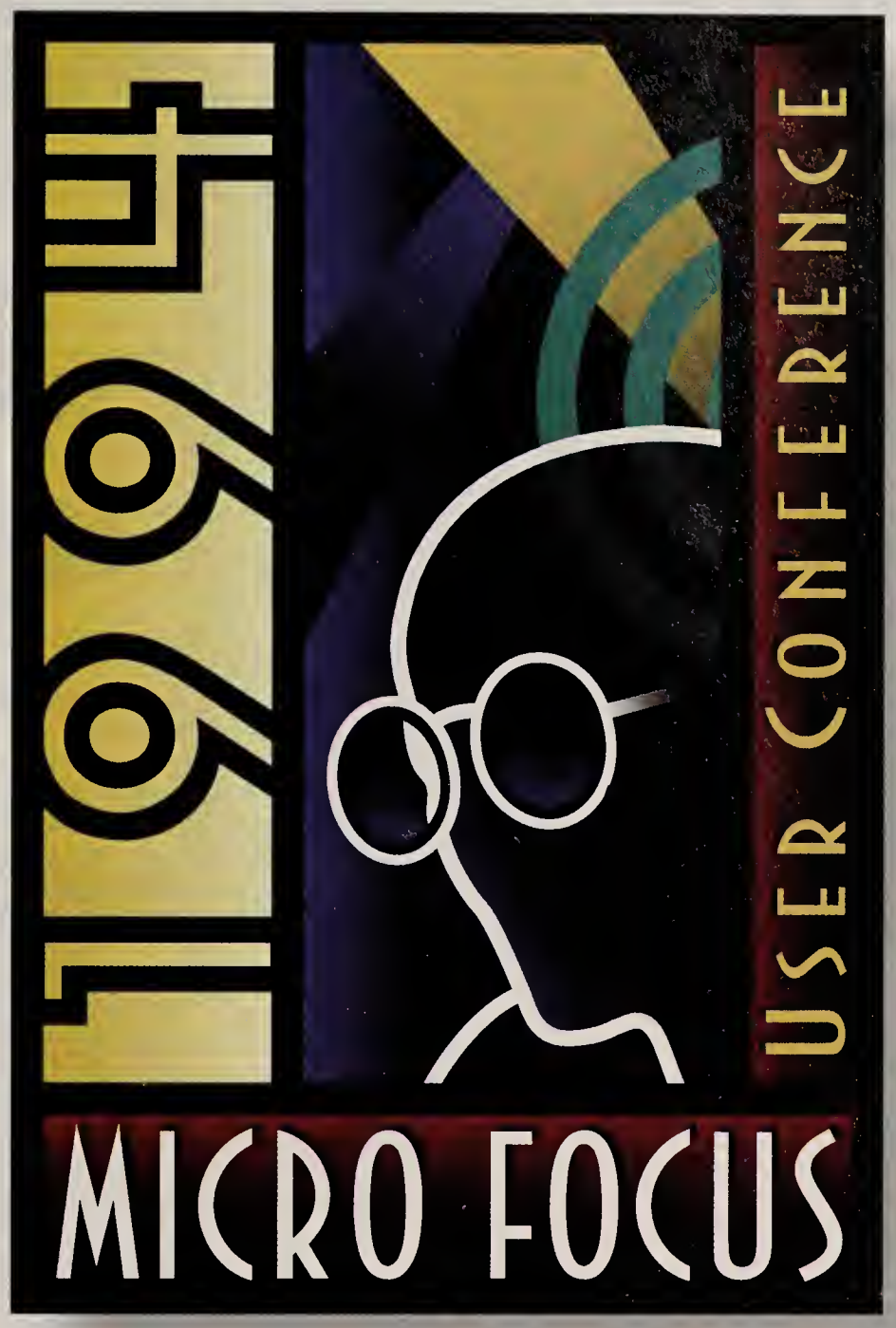
InfoTap is a new market for SAS, and one analyst suggested the company is branching out in too many directions these days. "They want to be in every market, but they need to figure out which one they should be in," said Howard Dresner, an analyst at Gartner Group, Inc. in Stamford, Conn.

SAS executives countered that criticism, saying that individual products may tap many different market segments but they all address the general function of information delivery.

Other announcements included the following:

- An upgrade to the SAS System for PCs. Version 6.10 supports the Microsoft Win32s and IBM OS/2 2.1 environments. Priced on an annual fee basis, the software starts at $940 per user.
- A Macintosh version of the SAS System is scheduled for beta shipments this summer. It will support both Motorola 68000-based Macintoshes and Apple Computer, Inc. Power Macintosh systems. Pricing is not yet available.
- New versions of SAS JMP software — a set of statistical data visualization and exploration tools — were introduced for the Windows and Power Macintosh environments. The Macintosh release is an upgrade and will cost less than $50, while the Windows release will be a first-time offering for that desktop platform. Pricing has not yet been determined for the Windows version.
- A query tool for IBM's DB2 was announced and will be shipped as an extension to SAS/Assist, a menu-driven data access package.

— Rosemary Cafasso



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Piracy on the rise; companies fear liability

MIT case highlights user vulnerability

By Gary H. Anthes

The recent indictment of a student at MIT for his management of a bulletin board allegedly used to distribute copyrighted software raises troubling legal issues for users and their companies. This is particularly true as Internet connections proliferate in the business community.

For their part, software vendors praised the action as evidence of a new get-tough posture by law enforcers against a practice they say costs them millions of dollars annually (see story page 1).

Internet access

Explosive growth in the use of the Internet — to which the MIT computer holding the bulletin board was attached — has left software companies tremendously exposed to theft of their products, said Ken Wasch, executive director of the Software Publishers Association in Washington.

"A pirate bulletin board on the Internet is like a world kiosk for free information," he said. "Before, you might have had a bulletin board with a couple of hundred people on it; now it's 20 million."

"We are concerned about the precedent this might set if it were found that a machine was used by an employee for a similar kind of activity," said David Pensak, principal consultant for advanced computing technology at Du Pont Co. in Wilmington, Del.

High cost of piracy

In 1993, worldwide losses due to piracy of business application software were $7.45 billion, according to the Software Publishers Association.

The Top 3 types of software piracy are: corporate end-user copying, illegal loading of software onto PCs by dealers and downloading from bulletin boards, according to the Business Software Alliance.

Pensak said states have considered laws that would expose companies to criminal penalties for illegal acts committed with their systems or data if it could be shown that the companies were negligent in safeguarding their systems.

"That really sends chills down my spine because then the decision about whether or not I am doing an adequate job of managing my system is made by 12 people in a jury box, many of whom couldn't spell Unix if their lives depended on it," Pensak said.

He noted that Du Pont performs spot audits to police itself. "If we find anyone with illegal software, we nail them to the wall," Pensak said.

Companies held accountable

"It is something to be worried about," said Pamela Samuelson, a law professor at the University of Pittsburgh. "Many people would be surprised at the extent to which corporations can be held criminally liable for acts of their employees even if there was no knowledge by the corporation's officers of the behavior. The company does not have to have actively engaged in the activity."

Bulletin boards offer a tempting spot for such activities, some vendors said.

Andrew Preston, president of T\Maker Co. in Mountain View, Calif., said his company's Click-Art software is frequently pirated off bulletin boards. That presents a real cost to law-abiding users, he said, because software prices are set to recover vendor costs, which means unit prices must be set higher when sales volume is low.

The felony indictment of David LaMacchia, a 20-year-old junior at MIT, alleged that LaMacchia operated a bulletin board knowing it facilitated the illegal distribution of copyrighted software. He was not accused of posting software to it, downloading from it or of profiting from the alleged illegal activities.

The student's defense revolves around the assertion that a bulletin board is just a conduit for information and the notion that organizations such as telephone companies, book stores and newspapers cannot be prosecuted when information they convey is used illegally by others.

The notion that people on the Internet should be allowed to do pretty much as they please does not enjoy universal support, however.

Robert Kruger, director of enforcement at the Business Software Alliance in Washington, attacked an assertion published last week in *The Wall Street Journal* by Harvard Law School Professor Laurence Tribe. Tribe said that the LaMacchia indictment "might chill the open transmission of information in cyberspace."

"He's got that totally backwards," Kruger said. "The chilling effect is if publishing companies are afraid to allow their products to be carried on-line for fear of being ripped off."

Users stymied

CONTINUED FROM PAGE 1

demic environments.

While MIT's bulletin service made news recently, users are more concerned with controlling not only compliance but also software asset management and costs at their sites.

"We try to be compliant and save the company the embarrassment of an audit," said Ki Wilson, microcomputer specialist at Stone Container in Chicago. "We get the legal department involved, human resources and accounting. But the fact is that I have no way of knowing whether we are 100%-compliant with our software license agreements."

"The fact is that I have no way of knowing whether we are 100%-compliant with our software licensing agreements," said Ki Wilson, microcomputer specialist at Stone Container.

PCs lacking

The problem stems from the fact that while mainframes were built with monitoring capabilities, PCs were not. The best that PC software offers today is metering and distribution on a departmental LAN basis.

However, attendees at a licensing session held at a recent Chicago Area Microcomputer Professionals conference complained that there is no standard way for information systems to control PC software on a centralized basis and that the SPA and its members are not doing enough to provide users with guidance.

Even worse, IS is now realizing that soft costs in managing and maintaining PC software are getting out of control. And users are paying on average 10% to 20% more for software licenses than they need to, according to recent studies conducted by Gartner Group, Inc., a consultancy in Stamford, Conn. At a global site, this would be measured in millions of dollars of waste.

"If I can't effectively measure how much software is used at my site, how can I tell you how much I need, or how much it costs me?" said Gene Friedman, vice president of applied technology/IS at The Chase Manhattan Bank NA in New York.

Friedman's group manages more than 26,000 PCs worldwide. "If I don't know how much I need, I don't know how much to buy," he said. "It all comes down to control."

In an effort to address the problem, software vendors and resellers are trying to offer a number of license packaging options.

A more recent trend is for the user to negotiate a contract that does not require any involvement in software compliance whatsoever, said Gunar Mallor, program manager at Corporate Software, Inc., a software reseller in Canton, Mass. The user gets charged for the number of desktops at his site, instead of how much software he uses.

"That makes sense if all you use is a word processer or spreadsheet," Wilson said. "But it doesn't when you take into account other applications like a presentation package or some utility. It is not practical."

Users also voiced disappointment with the vendors' emphasis on software distribution. Wilson noted that Microsoft Corp.'s Hermes will include software distribution in its initial release but will not include software metering across the enterprise.

"What that says to me is that they will give you a tool to push more licenses out onto the hard drive," Wilson said, "but they are not as interested in giving us the ability to centralize our software and potentially purchase less of it."

1993 statistics

Illegal copies of software are still a big problem at corporate sites

Total loss of revenue due to illegal software copying	$1.6B
Total fines to corporate sites	$3.6M
Lawsuits for illegal software copying	245
Organizations targeted for investigation	577
Cease and desist orders issued	332

Source: Software Publishers Association, Washington

Fix on the way

Acknowledging that the problem is out of control, users and vendors are working on a technological solution to the problem.

By inserting an application programming interface (API) for license servers, or the License Server (LS) API (see story page 47), in desktop applications and servers, and then rolling out utilities that can monitor the enterprise, users could be given some modicum of control over their software usage.

Currently, Novell, Inc. and Microsoft Corp. are beta testing software development kits that will enable developers to build software that adheres to the LS API standard.

While some LS API products are expected to roll out this summer, the standard cannot be fully exploited until it makes its way to clients and servers as well as utilities. Users are not even sure it will work, and until then, their ability to comply with licenses — and the credibility of the licenses themselves — will be undermined by IS's lack of control.

"As long as I have different terms, requirements and dates for using software and have no way to meter it across the enterprise, it is impossible for both us and the vendors to comply with our contracted software obligations," Friedman said.

"Who knows? I might find I need more software and buy more," he said.

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Hyatt offers IS guns for hire

CONTINUED FROM PAGE 1

first customer contract. LaQuinta Inns, Inc. in San Antonio has licensed and implemented a customized version of the Hyatt reservation system.

LaQuinta and Hyatt would not discuss the value of RSS' first contract. However, Sam Peace, LaQuinta's vice president of IS, said the payback for LaQuinta's systems upgrades — including an unrelated upgrade for its corporate financial package — would come in three or four years.

Older mainframe

LaQuinta turned to RSS in late July after deciding to get off its decade-old Unisys Corp. 2200/400 mainframe, which was running a homegrown, Cobol-based reservation system. "There was nothing wrong with it, other than it ran on an old platform and [that] the cost of the [Unisys] system software licenses kept increasing," Peace said.

LaQuinta's new system runs on Hewlett-Packard Co. HP/UX processors.

Peace said he was more skittish about being RSS' first customer than about buying his new reservation system from Hyatt. "We're in completely different markets. We're in the same industry, but we don't compete," he explained, referring to Hyatt's status as a high-end hotelier while LaQuinta is a regional budget chain of motels.

However, Hyatt may have much more difficulty marketing to direct competitors. Irene D'Aloisio, manager of corporate systems at Westin Hotels & Resorts in Seattle, said she would be reluctant to purchase systems from RSS.

"I don't think we'd care to have them know what our business is," she said.

In addition, D'Aloisio said that Westin's current reservation system, Westron, is the same core system Hyatt used before its own platform change in 1990.

Clean break

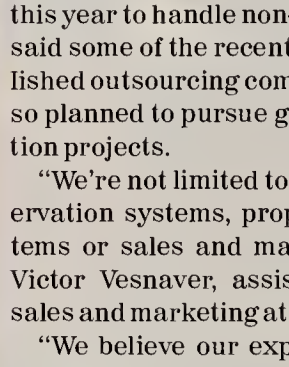
Hyatt certainly improved its old system when it moved to Unix and a relational database, but it might have carried some of the problems of the old system to the new design, she said. "If I was looking to outsource for a new system, I would want a totally fresh look at great savings," D'Aloisio added.

Westin is currently engaged in a two-year enhancement program for its reservation system but has no plans to jump to Unix.

Hyatt officials said they intend to sell their reservation system outright in cases where a competitor might be concerned.

While analysts said the hospitality industry has been relatively quiet on the outsourcing front, they noted that Hyatt's RSS does face established competitors. RSS will go up against at least three existing players, according to Douglas Rice, vice president of Graycon Group, Inc., a hospitality marketing and automation consulting firm in Schuamburg, Ill.

"Holiday Inn Worldwide in Atlanta spun out its ResCom subsidiary two years ago, but they have not been offering to outsource reservation agents," Rice said.



CIO John Biggs: *RSS will add 30 IS staffers this year, some with outsourcing credentials*

Crowded field

The other competitors are Electronic Data Systems Corp., which provides data processing services to Hospitality Franchise Systems, Inc. in Parsippany, N.J., owner of Howard Johnsons, Ramada International Hotels and Resorts, Days Inn of America, Inc. and two other hotel chains; and First Data Corp., an American Express Co. unit offering transaction processing. A year ago, First Data purchased Anasazi, Inc. in Phoenix, a vendor of Unix-based reservation systems.

According to Biggs, Hyatt has been quietly beefing up the staff and skills of its 150-person IS organization and plans to add 30 employees this year to handle non-Hyatt customers. Biggs said some of the recent hires came from established outsourcing companies and that RSS also planned to pursue general systems integration projects.

"We're not limited to the development of reservation systems, property management systems or sales and marketing systems," said Victor Vesnaver, assistant vice president of sales and marketing at RSS.

"We believe our expertise goes far beyond that and into the integration of all those systems," he added.

Source: Graycon Group, Inc., Schaumburg, Ill.

RSS offerings

Based in Oak Brook, Ill., RSS will continue to provide systems development and operations services to Hyatt. Initially, the new subsidiary will offer three kinds of products to outside companies:

- Licensing and implementation of Hyatt's own central reservation system, Spirit, which uses Unix hardware and a relational database from Informix Software, Inc.
- Transaction services out of its data center in Oak Brook.
- A "turnkey" outsourcing solution whereby Hyatt's own central reservation center in Omaha will handle a hotel chains' reservation calls and associated data processing.

IBM pitches

CONTINUED FROM PAGE 1

other efforts yet to hit the market.

In-Touch looks like it will be a long time coming, though. The late May announcement will be a technology and directional statement only, sources close to IBM said. They added that users should not expect In-Touch for 18 months or more.

Yet if it works as expected, it may well be worth the wait. When In-Touch is complete, it promises to give corporate users sophisticated, even slick, access to corporate and independent databases and on-line services via wired or wireless access.

Information filter

In-Touch will use intelligent agent technology to filter out unwanted information and let users search data sources for information they specify, sources said. Pricing is expected to match that of cellular phone services.

Users contacted expressed guarded interest in In-Touch.

"On the surface it seems useful," said one IS executive briefed on the technology, who requested anonymity. "We'd love for people to be able to dial in without worrying about where they are and how they get in."

William I. Lodge, a project leader at The Turner Corp., a multinational construction company in New York, was more leery of the product. But, he said, In-Touch "sounds like it could be a product our executive group might be able to use."

The Advantis value-added network will serve as the backbone for In-Touch, permitting users to pull messages and other information through gateways that link with such on-line services as CompuServe, MCI Mail, America On-Line, Nexis/Lexis and others. Third-party software vendors will use IBM's Rexx scripting language to create applications for In-Touch, the sources said.

Big blue net

All the planned gateway connectivity and information access will make In-Touch effectively IBM's "version of the Internet," said one source close to the company.

IBM declined to comment on In-Touch.

Pieces of In-Touch will appear throughout the next year or so. This week, for example, IBM will announce Intelligent Messaging, an X.400-based messaging server that is an In-Touch component (see story page 15).

In mid-May, an IBM PC Co. ThinkPad announcement will provide another piece of In-Touch. Bundled with new high-end ThinkPads will be Rover, IBM-developed software that will let users access E-mail from various services through one central mailbox (see related story below).

Rover sets up one mailbox

The most interesting component of the IBM PC Co.'s mid-May wave of ThinkPad notebooks will be Rover, a software package for accessing E-mail through one central mailbox. In addition, Lotus Development Corp.'s CC:Mail will be bundled into high-end ThinkPads, sources said.

Using Rover and CC:Mail, remote users can connect to the Advantis network, which will provide gateways into CompuServe, MCI Mail, America On-Line and other services, according to sources.

Another salient feature on the ThinkPad 355 is its 8½-in. active-matrix color screen. These screens are readily available and might ease supply problems for some users currently consigned to the purgatory of the ThinkPad 750C's backlog.

IBM will also unveil the ThinkPad 755 family, which will feature Intel Corp.'s new 25/75-MHz DX4 chip as well as the 25/50-MHz I486DX2.

Also on the add list is a 540M-byte hard drive for additional storage. The third leg of the hardware announcement is the ThinkPad 510 subnotebook, which will have a faster processor and a dual-scan passive-matrix color screen, sources said.

— Michael Fitzgerald

Show spotlights messaging options

By Lynda Radosevich

Corporate users at this week's Electronic Messaging Association (EMA) annual conference and trade show in Anaheim, Calif., will face a different messaging landscape than they did even a year ago.

That is because two recent mergers — Novell, Inc./WordPerfect Corp. and Banyan Systems, Inc./BeyondMail, Inc. — will result in technology combinations that will add viable choices to a LAN-based messaging market that Lotus Development Corp. and Microsoft Corp. have increasingly dominated.

"The mergers give hope that we're not in a two-company world," said David Marshak, a vice president at Patricia Seybold Group in Boston.

The question now is whether users will be wooed by Lotus' and Microsoft's enterprise messaging products before they rethink their strategies and factor in their competitors, analysts said.

With that in mind, Bill Gates, Microsoft chief executive officer and conference keynote speaker, will demonstrate Microsoft's unannounced but widely discussed Enterprise Messaging Server (EMS) and Microsoft Mail 4.0 client, which are expected to ship near the end of the year as part of the Touchdown line.

The mail client will get a new name, Information Center, to reflect its new role as a "universal" in-box. Gates will demonstrate the client accessing the Internet and responding to voice commands using Radish Communications Systems, Inc. technology, according to Microsoft officials.

Phoning Notes

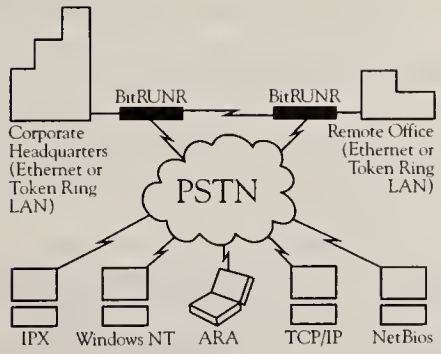
Meanwhile, at the Lotus booth, executives will stress the current availability of Notes, as well as its capabilities that go beyond messaging. Also, Lotus will announce Automatic Directory Exchange 2.0., which adds wide-area management and automation features to the software that synchronizes directories on different CC:Mail servers. The company will announce shipment of Phone Notes, a tool kit that lets developers build applications for accessing information in Notes databases over the telephone.

These days, both users and vendors are looking at messaging as more than just person-to-person electronic mail. In response, Microsoft, Lotus and others will position their products as the messaging infrastructure for intercompany group applications and intracompany information highway applications.

However, users' messaging infrastructures are still in major need of management capabilities — everything from message tracking to addressing schemes to standards, according to EMA President Bill Moroney.

Other happenings at the show will include the following:

- IBM will preview an X.400 messaging server that can run popular front-end mail clients and will serve as the engine for the company's workflow and networked applications. It is said to be similar to Hewlett-Packard Co.'s OpenMail.
- HP will announce that its OpenMail X.400 messaging and X.500 directory server has links to Notes that permit Notes mail clients to natively operate on the OpenMail server.
- Isocor will unveil a line of software applications that work on Microsoft's EMS and Unix servers via the Microsoft Application Programming Interface Version 1.0. Called Mapiware, the applications run the gamut from E-mail to electronic data interchange and support digitized audio and video in addition to the usual text, data and graphics formats.
- Messaging integration vendors WordTalk Corp. and Control Data Systems, Inc. will unveil their combined messaging switching technology, which is said to ease the process of translating E-mail addresses among different LAN, Unix and mainframe systems. The companies plan to ship the combined switch in the third quarter.



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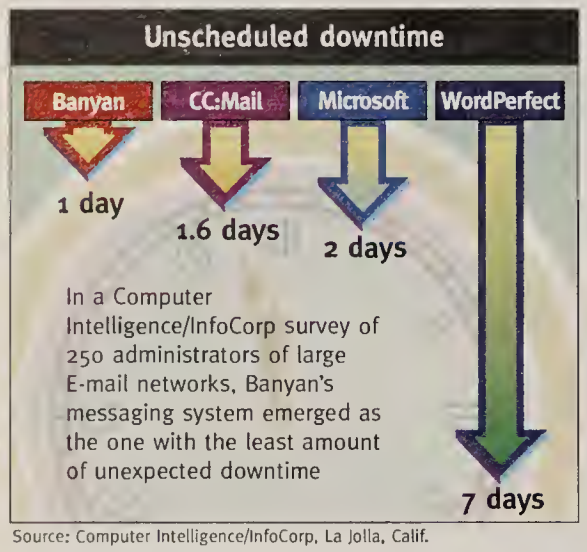
Enterprise services

Banyan to ship NT version of ENS

By Elisabeth Horwitt
ATLANTA

Banyan Systems, Inc. last week announced its intention to add Microsoft Corp.'s Windows NT to the mix of server platforms that corporations can integrate via its Enterprise Network Services (ENS) offering.

ENS currently is said to provide single-user log-on access, as well as directory, security and administration services across Novell, Inc.'s NetWare 3.x and 4.x, The Santa Cruz Operation's SCO Unix and Hewlett-Packard Co.'s HP/UX systems.



Source: Computer Intelligence/InfoCorp, La Jolla, Calif.

An NT version of ENS is slated to ship in mid-1995, Banyan spokesmen announced at last week's Association of Banyan Users International (ABUI) conference here. IBM and Sun Microsystems, Inc. Unix versions are slated to ship by year's end.

ENS for NT will add two kinds of value for Microsoft customers, according to Bob Martin, Banyan's director of product strategies. First, it will make it possible to administer NT Advanced Server directories and user log-ons enterprisewide much more easily. "Today you can stretch [NT's Trusted Domain directory structure] across the enterprise, but it requires a lot of manual administration," he said.

Secondly, ENS will enable Domain servers to "interoperate and work with the NetWare world," Martin said.

Some ABUI atttendees displayed only mild interest in adding NT servers to their Vines networks. But the real question is whether the addition of NT support will help sell ENS outside of Banyan's current Vines installations, which have been stuck at about 7% of the total network operating systems market for the past couple of years, according to Computer Intelligence/InfoCorp.

Banyan could begin to cut a swath in the market if it could successfully provide ENS's StreetTalk enterprise directory as a front end for managing resources across NT and NetWare, said Ted Vegvari, a Torrance, Calif., network design consultant. He said that if Banyan could provide an acceptable "level of service and responsiveness for those environments," he would recommend ENS to his corporate clients.

Too little, too late

However, despite the fact that Banyan has a technically strong enterprise services line, the company has already turned off many potential corporate customers by continued unresponsiveness in crucial areas such as support and early access to key technologies, Vegvari said.

Banyan also plans to integrate its services with Microsoft's future Enterprise Messaging Service and Cairo offerings, a company spokesman said. Banyan announced last week that it plans to support Microsoft's Mail API 1.0, which gives message-enabled applications access to a growing throng of messaging back ends.

In addition, Banyan announced last week the shipment of its NT client for Vines.

Pricing changes still worry users

Banyan Systems, Inc. tried with limited success last week to convince a semiannual gathering of its customers that its recent price restructuring will not put an added strain on network software and administration budgets.

Banyan alarmed many of its large customers in February when it announced — with no prior warning — that it was abolishing the limitless user license for its Vines network operating system and ENS and substituting tiered, user-based pricing.

Banyan spokesmen said this was an interim step to full enterprise pricing but the interim could last years, while the industry develops enterprise usage metering technology.

"The pricing change shook the user community to its roots," said Ted Kull, a project manager/systems engineer at the Educational Testing Service in Princeton, N.J. "We used to have Vines without user limits; now we have 10-, 50-, 100-, 250- and 1,000-user limits."

Last week, the company provided the following clarifications for its pricing structure, which officially took effect this month:

- The tier number determines the number of users that can be logged on to a given server at one time, not the total number of users that can access that particular server.
- Banyan will initially let customers police themselves with the help of auditing tools that it plans to provide shortly. Later on, Vines and ENS will have built-in auditing and alarms.
- Customers can migrate to the new structure whenever their VIP license contract comes up for renewal. If they choose the 50-user or more license, they can migrate to a larger-capacity license through September at no extra charge. Furthermore, a 50-user license for each server gives all users the right to access all Vines and ENS services.

Could cost more

Even so, customers may get hit with extra user administration costs, said Thomas Schuyler, manager of telecommunications and distribution at Delaware Health and Social Services in Newcastle, Del.

Where the organization's unlimited license plan now gives users access to all servers, server-based pricing means "every one of the user groups will have to ask me whenever they decide to add a few users," Schuyler said.

—Elisabeth Horwitt

Net management

CONTINUED FROM PAGE 1

"The ability to distribute the processing of management tasks is absolutely essential in large enterprise networks with more than 1,000 nodes, where one server simply is not enough," said Jill Huntington-Lee, principal analyst at Brandywine Network Associates in Cinaminson, N.J. "It will also let you have multiple clients with their own view of the same management data."

Users said distributed processing was vital because it would essentially allow multiple management stations to look at every device on the enterprise network without having to poll them individually. Traditionally, polling must be performed on every network device from a centralized management server. This method creates vast amounts of network traffic, which leads to bandwidth congestion problems and high wide-area connectivity charges.

For users frustrated with this process, the news that distributed functions would soon be widely available was a boost.

"All vendors have had trouble when it comes to Network Management 101 — providing a usable management platform," said Michael Smith, manager of telecommunications at Credit Suisse, a Spectrum 3.0 beta site in New York. "Network management companies are just now starting to look at the fundamentals of what a good management platform has to do, and it's about time!"

Also on the move

Meanwhile, Hewlett-Packard Co. is not sitting idly by. The company announced last week its long-awaited OpenView repository based on Oracle Corp.'s Oracle 7 database, which has management capabilities.

This repository will provide a vehicle for different management applications to share data. For example, a configuration management application can provide a troubleshooting application with the layout of a crashed LAN.

Oracle 7 also allows management data to reside on multiple nodes that act as domain servers managing a local network installation. OpenView with Oracle 7 support will go into beta testing by the end of the summer and will ship by year's end, HP said. OpenView currently supports only the Ingres database from The ASK Group, Inc.

Users, while upbeat about the support, were not satiated.

"It's been recognized for a while that DBMSs need to be managed from a common console, and this is a step in the right direction for HP," said Frank Belland, senior communications consultant at Martin Marietta Corp. in Orlando, Fla., which uses HP's OpenView.

"However, I want my Sybase support now, which I've been asking for since '92," he added. "Hopefully, I won't have to wait until '95 for it."

An HP spokesman said the company will provide support for the Sybase database, as well as Informix Corp.'s Informix database, within 12 months.

Industry observers agreed that vendors' ability to provide distributed capabilities was crucial to their long-term survival.

"The industry has reached a point where users' distributed networks and plans are big enough where vendors need to provide this capability to move forward," said Rick Villars, an analyst at International Data Corp. in Framingham, Mass.

The OpenView platform currently does not support distributed processing. Users can achieve a similar level of functionality by purchasing multiple copies of OpenView, but analysts said this adds a great deal of complexity and expense to the network.

Object-oriented

The HP spokesman said the company is also working on an object-oriented version of OpenView that will offer distributed processing, but he declined to give a shipment date.

HP is also expected next week to announce an update to its OpenView for Windows platform that will allow users to share data with Unix-based OpenView consoles.

"This would be a great help because it would allow you, for example, to manage Novell devices from Windows, which is much more expensive and complex on Unix," Belland said.

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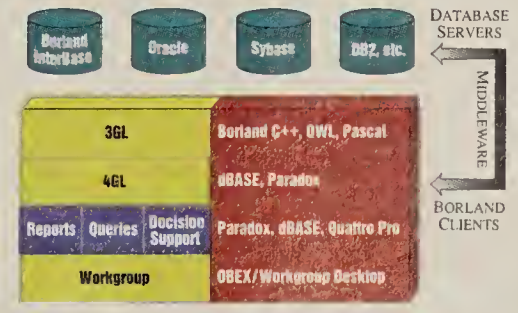

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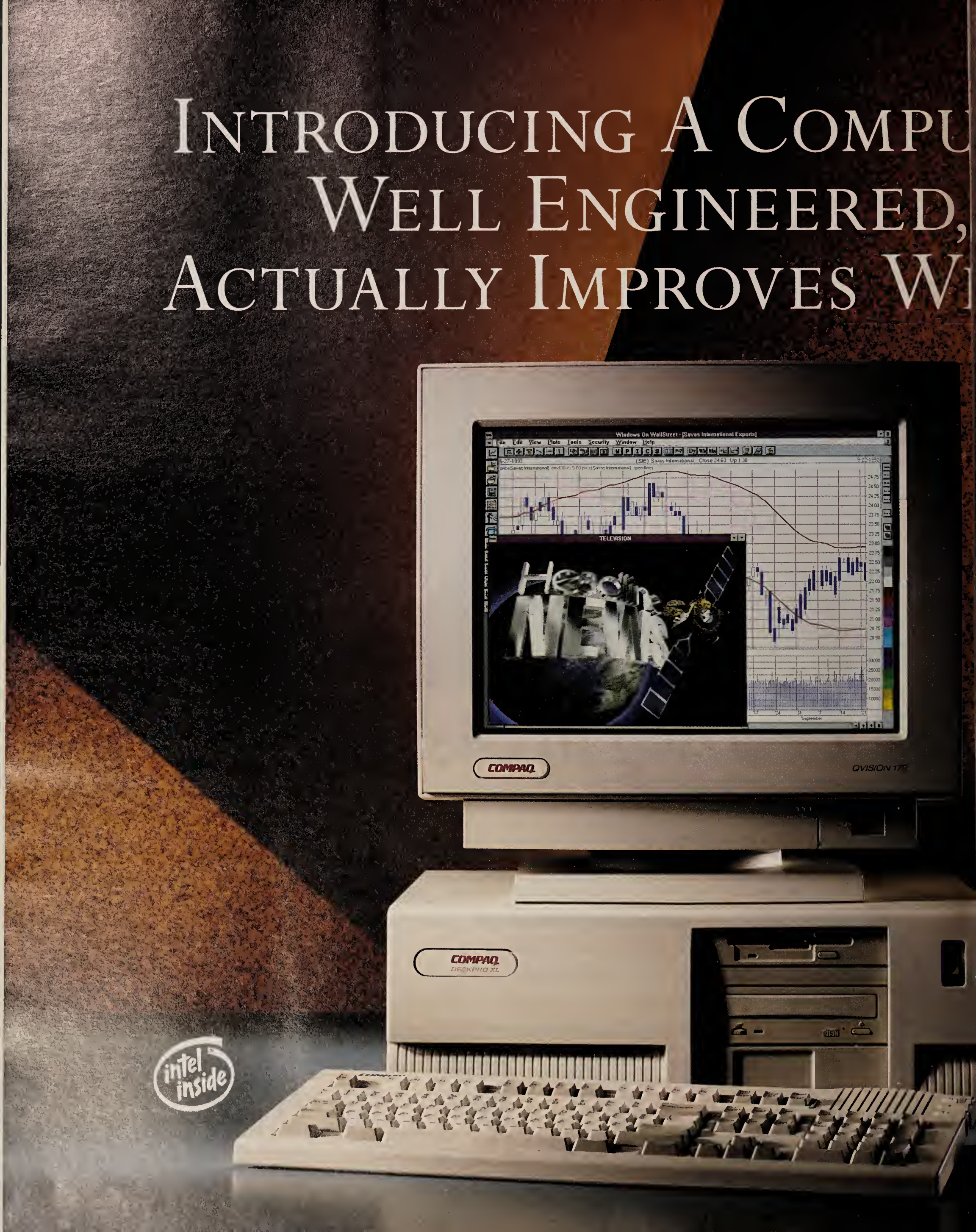

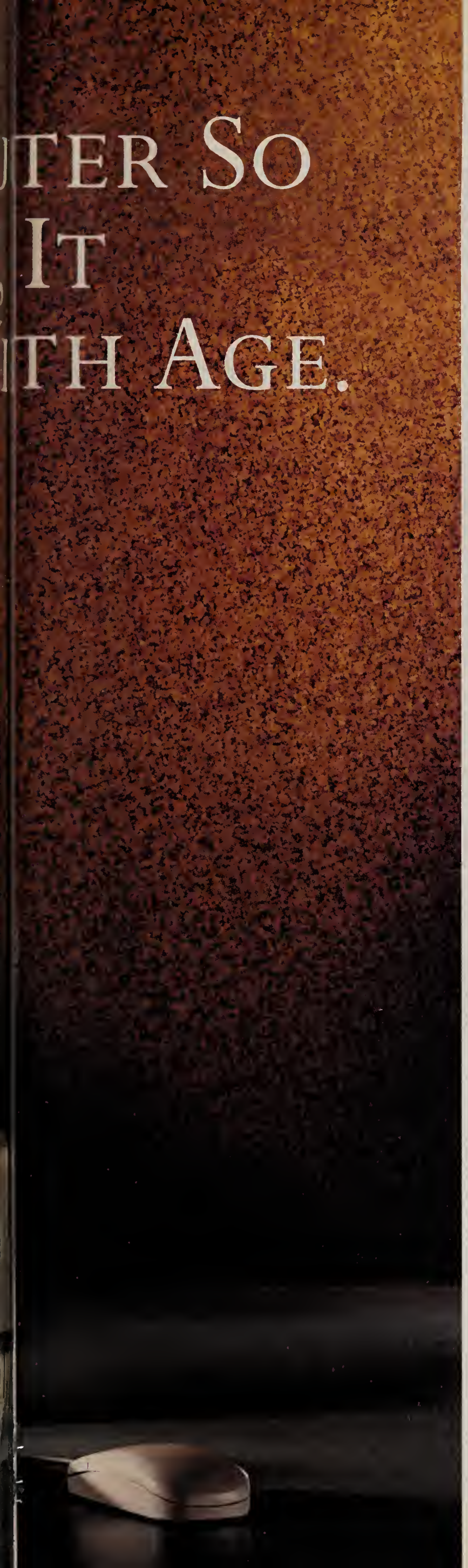

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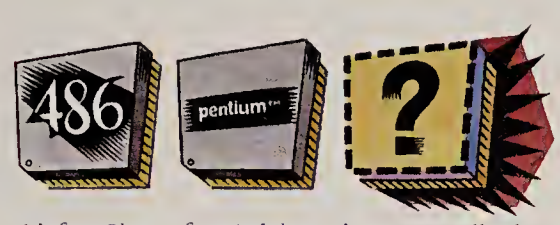

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Unisys hosts fuel up with GaAs

By Thomas Hoffman
NASHVILLE

If the mainframe is dying, then no one has bothered to tell Unisys Corp.

Last week, the Blue Bell, Pa., computer maker introduced the industry's first eommereially available hosts to run on gallium arsenidc (GaAs)-based chips — boosting performance up to 60% over the previous generation of Unisys mainframcs.

GaAs chips were designed to conduet electricity faster and more eost-effeetively than silieon teehnologies. Beeause eleetrons can move through GaAs five to six times faster than through silieon, data can be processed faster and mainframe heating and electrical costs can be reduced.

Unisys unveiled its new GaAs-powered A11 mainframes before more than 1,800 attendees at the Unite North America Unisys User Association conference held here last week. The hefty performance boosts elicited favorable reaetions from the A Series crowd.

For example, the U.S. Department of the Interior's Bureau of Indian Affairs in Albuquerque, N.M., will eonsider replacing its two A10 maehines with a single A11 system. The system will not only beef up its performanee but also shave annual maintenance costs by $200,000, said Curtis Winters Hohenstien, a computer specialist at the agency.

Analysts also gave Unisys high marks for its leading-edge mainframe development aetivities.

In 1989, Unisys was the first vendor to implement CMOS into a mainframe-class instruction set; in 1990, it was the first mainframe vendor to deploy specialized microprocessors to off-load key host processing tasks; and in 1991, Unisys rolled out the first commercial application of high-performanee parallel processing to handle I/O for a host system, according to Brian Jeffrey, managing director at International Technology Group, a Los Altos, Calif.-based eonsulting firm.

Unnoticed

In fact, many industry pundits say Unisys' host-oriented aehievements in recent years have been largely overlooked due to poor marketing. "They've got guts to do gallium arsenide," said Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass., noting unsuccessful attempts by competitors sueh as IBM to implement GaAS teehnologies on commereial platforms.

Unisys is licensing the GaAs technology from Vitesse Corp., a Camarillo, Calif.-based semieonductor maker.

A Series revenue grew 12% in 1992 but showed only 4% to 5% growth in 1993 for all hardware, software and peripheral sales. The eompany realizes that mainframe hardware revenue growth will continue to shrink, but it is counting on software and services revenue to supplant that lost ineome, said John A. Rioux, Unisys vice president in charge of A Series products.

The 10 A11 models — priced from $375,000 to $975,000 — were ushered in alongside 16 new A18 models, which range from a single-proeessor configuration to a six-way machine. The CMOS-based A18s require a mere 9.6-sq-ft footprint while boasting 2.3G bytes of power in an air-cooled enclosure. A six-way A18 offers a 51% power reduction over a four-processor A19 hub with a 67% smaller footprint.

More for your money

That was good news for several A Series customers whose shops are looking to upgrade. "I like coming in at the beginning of a product eycle, since I end up getting more bang for my buck," said James R. Ferguson, a systems specialist at Sarasota Memorial Hospital in Sarasota, Fla., whose organization will likely upgrade from a 4-year-old A12 to one of the new A18 models.

A single-processor A18 starts at $451,000, while a six-way machine is prieed at $11 million. All new A Series systems are available now.

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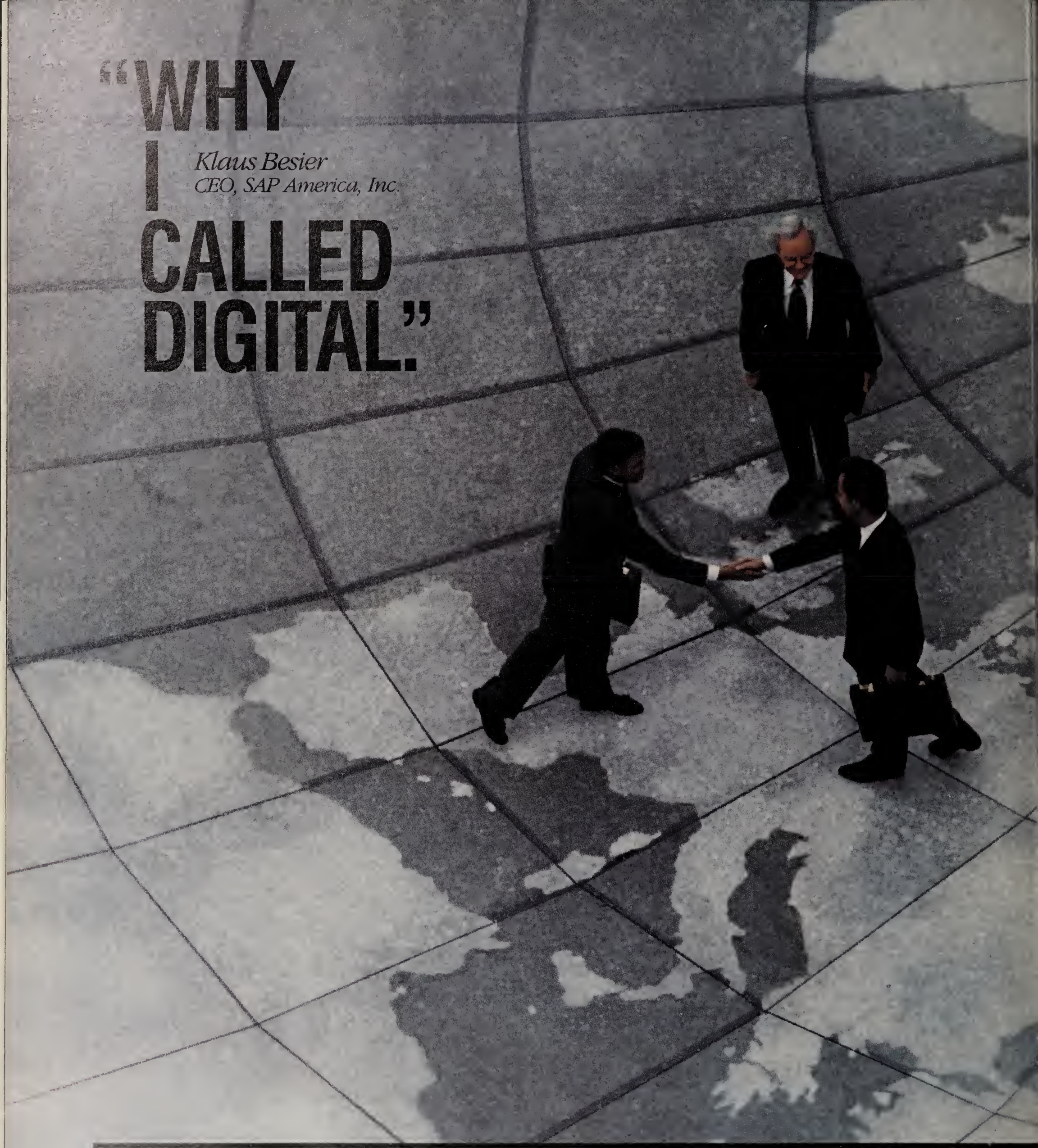

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KnowledgeWare broadens its outlook

By Melinda-Carol Ballou
ATLANTA

"What will KnowledgeWare look like in 1997? Much more like Microsoft than like IBM if we get our way," said KnowledgeWare, Inc. President Don Addington at the company's user conference here last week.

KnowledgeWare is clearly aiming high as it attempts to break the mold of a traditional mainframe computer-aided software engineering (CASE) tools vendor. Through a series of alliances and product acquisitions in the past 18 months, KnowledgeWare has targeted markets ranging from low-end client/server tools to re-engineering legacy applications.

User concerns expressed at the conference focused on KnowledgeWare's ability to concentrate on many new projects while retaining a full commitment to its Application Development Workbench (ADW) CASE tools. As part of a multiplatform strategy for ADW, the company is expected to ship a Unix version in September and a Windows 4.0 version by December.

For the most part, however, customers were enthusiastic about these new directions because many of them are making similar moves.

"My perspective on the company is greatly improved as they open up ADW to other platforms and are moving to embrace object-oriented methodologies," said Rick Olson, a senior programmer/analyst at L. L. Bean, Inc., a retailer in Freeport, Maine.

"We want to move to client/server. That's our direction, and it's important to be able to tie our CASE tool into the client/server tools," said Peggy Ramsey, project manager at Continental Baking Co., a subsidiary of Ralston Purina Co. in St. Louis.

Object alliance

KnowledgeWare last week announced an alliance with Object Design, Inc. to bundle runtime copies of that company's ObjectStore object database with a new KnowledgeWare product. Dubbed Maxim, the tool will cost $199 and is expected to ship next month.

Maxim will let managers create analysis models of their business processes and then perform "what-if" analyses of how they might change those processes. They will also be able to hook those analysis models into ADW CASE tools to create designs from which applications can be generated.

As part of its push into re-engineering tools, KnowledgeWare is expected to announce an alliance with Burl Software Laboratories, Inc. to bundle Burl's Revolve technology with KnowledgeWare's Legacy Workbench tools. This will give developers a systemwide view of the re-engineering process in contrast to the single-application view KnowledgeWare currently provides.

The integrated Legacy Workbench and Revolve technology is expected to ship in the fall, as is ADW Release 3.8.

Bumpy transition

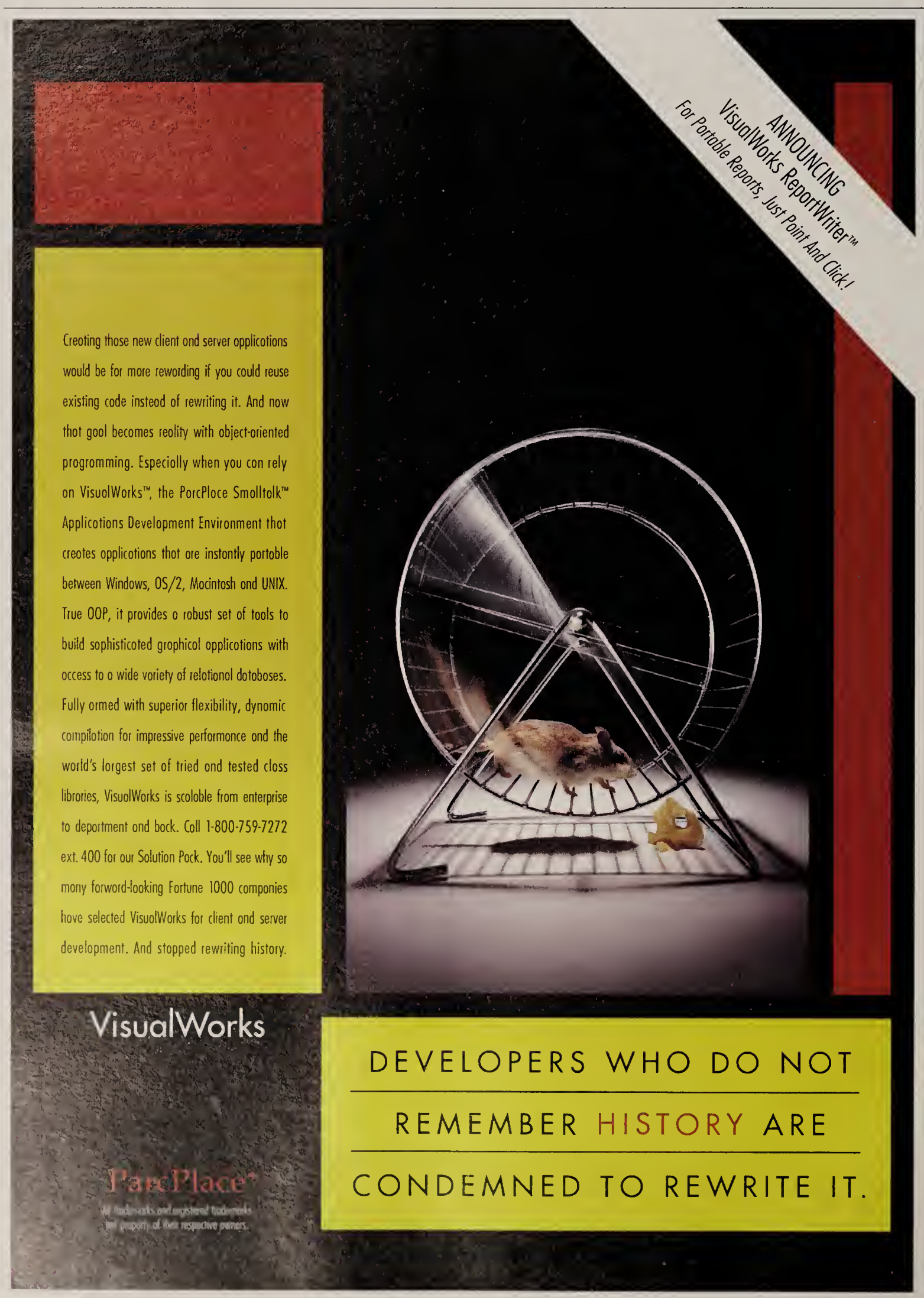
Yet users are still wrestling with the difficult conversion from ADW CASE tool Version 1.6 to Version 2.7, and customer confidence has been shaken since the company regrouped, cut staff and attempted to redefine itself.

"We know we have to please diverse groups of customers — the Lawrence Welk crowd and the MTV crowd," Addington said, referring to the company's established base of legacy customers and those moving to client/server environments.

But user worries about KnowledgeWare's support for ADW still remain.

"There's a lot more salesmanship [about the new products] than there is support for ADW," said Walt Dale, associate systems manager at Prudential Asset Management Co. in Moosic, Pa. His group has been struggling to make the transition from ADW Version 1.6 to Version 2.7.

Six other developers said they also had difficulties shifting to ADW 2.7, but not insurmountable ones. They also noted that KnowledgeWare satisfactorily helped them make the transition.



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Mobile computing changes business

New applications, tools signal wireless trend

By Michael Fitzgerald

Users are combining portable computers and advanced communications tools to drive their business forward in new ways. This signals the beginning of a broad trend that will continue throughout the decade, according to analysts.

"Mobile computing and communications in conjunction are the future," said Gib Hoxie, executive vice president of the Pacific Group, a consultancy in Santa Clara, Calif.

Vertical markets built around mobile computing technology, such as sales force automation and field service applications, will continue to "be a quiet revolution, but it's beginning to spead," said Ken Dulaney, a Gartner Group, Inc. analyst in Santa Clara.

For instance, Monsanto Co. said it will buy up to 40,000 Newton MessagePads from Apple Computer, Inc. Monsanto aims to outfit farmers with the devices and distribute information on fertilizer mixes and the like eventually via nationwide paging networks.

"That's a really important kind of application," Hoxie said. "Basically, they're developing a vertical application over a horizontal network, and it provides a new business for the airwaves and a new application for the user."

Wireless computing in general has piqued a great deal of interest. Most companies continue to kick the tires of wireless but keep their distance because of the high cost of the services and the specialized equipment required. But some are building the business case to do big rollouts of wireless-enabled notebooks.

For example, a pilot under way at Sears, Roebuck and Co. could lead to 14,000 service technicians receiving wireless-enabled notebooks. The current pilot uses the Ardis nationwide network.

The pilot already has proved the value of wireless communications. After the California earthquake, the Sears service center in Chatsworth was closed due to a gas leak. But because Chatsworth was the Sears pilot site, more than half its service technicians completed their daily routes because managers were able to dispatch them from another service center.

"We would have been out of business for the day if it weren't for [Ardis]," said Larry Finney, systems director at Sears in Hoffman Estates, Ill.

The Sears pilot underscores the kind of value businesses see in combining mobile computers with advanced communications. But Finney said it is not yet clear whether the fruit hangs low enough for information systems directors to grab.

Larry Finney: *Sears 'could own the service business'*

On the move

A study by BIS Strategic Decisions shows that 74% of all workers are "mobile workers" — spending significant amounts of time away from their desks even when in the office. In a 1,000-plus employee organization, 81% of workers spend more than 20% of their time away from their desk; 64% do so in a sub-100 employee organization.

For example, even though the Sears wireless pilot, called the Sears Portable Information Device, will be in four test sites by June, several issues could still derail a companywide rollout, Finney said.

Foremost among those issues is cost. Finney declined to specify numbers because Sears is still negotiating, but if the average price were a low $2,000 each, the notebooks for the 14,000 technicians would cost some $30 million — not including a pricey radio frequency modem and the cost of the communications service. Sears spends more than $1 billion a year on IS.

Another kink is that the Sears pilots use IBM's PC Radio, which was discontinued last year.

But the business case is still compelling. What if Sears could end the practice of a customer having to take a day or more off from work to wait for the service technician to repair an appliance such as a washing machine?

"If we can do that, we could own the service business," Finney said.

If Sears can pull off one-stop service, it would break an almost accepted maxim that "customer service always involves two trips," said Joseph McKinney, a retail management consultant at Cleveland Consulting Associates, a division of Computer Sciences Corp. in Cleveland.

A new way of life

The bulk of communications will be handled over land lines for at least the next two years, analysts acknowledged, but the combination of conventional communications and notebook computers can have a dramatic effect on how businesses work.

For instance, Nalco Chemical Co. has completely changed how its sales representatives get information with its N-COMPAS program [CW, Sept. 13, 1993]. Nalco, the biggest player in the specialty chemical market, will use Lotus Development Corp.'s CC:Mail as a network engine to connect users with one another and with data from "smart boxes" installed at factories that use its chemicals.

The stationary black box monitors the crucial ratio of chemicals to water used during the manufacturing process. At regular intervals, it uploads data on the mix into a centralized server at Nalco. This data is disseminated over the network to various account representatives who can then call in troublesome information to accounts, in effect giving them 24-hour service.

Microsoft may fit Levi Strauss re-engineering scheme

By Mark Halper

Levi Strauss & Co., which not long ago was heading down a Unix path, is taking a Microsoft Corp. detour as it slogs through a $400 million corporate re-engineering and work force reduction that could involve implementing Windows NT.

Later this month, Levi chief information officer Bill Eaton plans to lead a contingent of Levi information systems staffers to Redmond, Wash., to meet with Microsoft officials and map out technology directions, said Steve Levandowsky, vice president of global architecture at the $5.9 billion apparel maker.

Eaton, who declined to be interviewed, will seek computing solutions to buttress a top-to-bottom re-engineering effort that is shaking up the entire work force but is aimed at vastly raising levels of customer service (see chart).

Eaton said through a spokeswoman that implementation of Microsoft technology will not mean the exclusion of Unix, but that Levi sees a future using both as it relies less on mainframes. Levi is leaning toward Windows-based electronic-mail, word processing and spreadsheet software on the desktop, but server decisions have not been made, the spokeswoman said.

She noted, however, that Unix projects have been put on hold as Levi continues to overhaul its companywide work processes.

The re-engineering effort has faced some resistance within Levi Strauss. In the text of a speech to the Quick-Response '94 conference in Chicago last month, Levi North America Vice President Bob Rockey said that at first, "everyone seemed to have their own agenda and priorities" and described Levi's efforts as "like trying to herd cats."

Levandowsky noted that the sluggish pace of re-engineering, as much as any technology reasons, has caused second thoughts at Levi over its Unix direction.

Long an IBM and Hewlett-Packard Co. shop, Levi began sampling Unix two to three years ago with a pilot project dubbed Orion. The project relied on Sun Microsystems, Inc. servers, the SunOS 4.1.1 Unix operating system, a Sybase, Inc. relational database and object tools from ParcPlace Systems, Inc.

Orion was intended to help track shipments of materials from suppliers to factories to warehouses. But according to Levandowsky, the company has not moved much beyond it.

Pocket full of time savings

Levi's re-engineering effort aims to:

LEVI'S

- Develop and deliver new products in 90 days
- Update products within 30 days
- Deliver 95% of orders, all fully accurate, on the day and within the hour requested by customer
- Deliver "floor-ready" products: folded, on hangers, with price tags, etc.
- Jointly manage common supply chain with suppliers
- Organize by brand instead of consumer category

DAVE MARSHALL

Job loss expected

The late April meeting with Microsoft stems from a strategic partnership that Levi and Microsoft quietly entered into four months ago. That alliance grants volume discounts on Microsoft applications and calls for Levi to give Microsoft with input on development of products, including NT.

The re-engineering, orchestrated by Andersen Consulting, will include layoffs, said Tom Kasten, Levi's vice president of business re-engineering and customer service.

Sources said it may also involve relocating various operations out of San Francisco, where Levi has been a landmark company since it began selling dungarees to gold miners in 1849.

Levi is already in the process of moving its data center operations to Dallas, where the company rents inexpensive real estate from IBM and avoids the threat of earthquakes (CW, Jan. 3). Levi is also moving its Britannia division to Seattle, and the spokeswoman said other relocations would include moving centralized sales people closer to their accounts.

Levandowsky said the Microsoft partnership is patterned after strategic partnerships Levi has been striking with select non-information technology suppliers. For example, Levi and fabric supplier Burlington Industries are together working out means to assure more timely delivery of fabric.

PeopleSoft began shipping client/server applications before most people knew client/server existed.

1989	1991		1993
PeopleSoft HRMS 1 ships	PeopleSoft HRMS 2 ships		PeopleSoft HRMS 3 ships
		1992	**1993**
		PeopleSoft Financials 1 ships	PeopleSoft Financials 2 ships

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IBM DIRECT

Microsoft holds steady under probe

By Stuart J. Johnston
and Ed Scannell
REDMOND, WASH.

When it comes to winning, Mierosoft Corp. has learned a very important lesson — whoever holds out the longest often prevails.

The desktop software giant is onee again showing its willingness to endure — as it did in its protracted copyright suit with Apple Computer, Inc. — in order to shrug off accusations about anticompetitive practices. Whether it will be successful remains to be seen.

The Department of Justiee's Antitrust Division took over the investigation of Microsoft seven months ago from the Federal Trade Commission (FTC), which deadloeked after a three-year probe.

Headed up by Anne K. Bingaman, an old friend of U.S. Attorney General Janet Reno, the Antitrust Division has taken a much more proaetive eourse in pursuing cases of alleged anticompetitive behavior than under previous administrations.

Samuel R. Miller, a San Francisco attorney who sources said is "obsessed" with the case, is heading up the Microsoft investigation.

Bingaman's unusual and high-profile deeision to tackle Mierosoft suggests that it is unlikely the case will just fade away — despite Mierosoft's best efforts to the contrary.

"Anne Bingaman is a smart litigator. She'll use the rifle-shot approaeh, piek two or three of the worst things Microsoft has done that have a significant effeet on eonsumers and get the case to trial within a year," predicted Susan G. Braden, an antitrust expert at the Ingersoll and Bloch law firm in Washington.

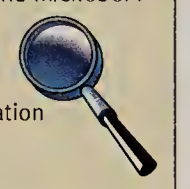
In faet, the Justiee Department recently requested more doeuments from the desktop software giant, a Microsoft spokeswoman eonfirmed. Industry attorneys said investigators wanted to update the record they inherited from the FTC and perhaps explore new issues.

Despite speculation that the Justice Department's probe of Mierosoft would end this month, it now looks as though it will drag into the eapital's steamy summer months and beyond.

"Whatever aetions [the Justiee Department] takes in any area of their business, it will be just a small ripple in a big pond," said John Dunkle, president of WorkGroup Technologies, Ine., a consultaney in Hampton, N.H. "With the sort of control they have in multiple markets, it is very hard to believe they eould lose momentum through any legal aetion."

Government gumshoes

THE FIRST PHASE OF THE MICROSOFT ANTITRUST PROBE:



NOVEMBER 1989:
Federal Trade Commission investigation of Microsoft begins.

FEB. 5, 1993:
FTC commissioners deadlock (2-2) on vote to file complaint with one abstention.

JULY 21, 1993:
FTC deadlocks again.

AUG. 20, 1993:
FTC ends its investigations; U.S. Department of Justice picks it up.

Going into surgery

Several analysts said the Justiee Department, which is still smarting from its ill-fated attempt to break up IBM, will try to make surgical changes at Microsoft rather than force a breakup of the Redmond, Wash., software titan.

One such change, for example, eould involve Microsoft's signing a consent decree that alters specifie business practiees. But so far, Microsoft Chairman Bill Gates has shown no inelination to compromise with the government, so the eompany eould be in for the kind of eourtroom ordeal experieneed by IBM and AT&T in their lengthy antitrust trials in the 1970s.

As the industry waits, however, Mierosoft eontinues to take larger shares of both the systems and applications markets away from its eompetitors.

So the question remains: By the time the wheels of justice grind down, will there be any eompetitors left?

Antitrust

CONTINUED FROM PAGE 1

case while at the Justiee Department's Antitrust Division in the 1970s.

That may be tough to prove. So far, there has been no hue and cry from corporate PC buyers about Microsoft's business practices, perhaps because the ill effects of industry consolidation take years to reach buyers.

The Antitrust Division will probably want to interview large corporate and government software users to see if Mierosoft's eompetitive tactics have reduced their software choiees or boosted prices, said Braden, who is not involved in the Microsoft ease.

The government may be able to show eonsumer injury based on statisties or economic theory, but reeent interviews with corporate information systems managers revealed only mild eoneerns and no sense of outrage over Microsoft's tactics.

Breaking up is hard to do

"I don't think this investigation is serving consumers at all," said Mike Drips, an IS professional at a large Florida-based telecommunications company. "An investigation that would break up Microsoft would be a detriment to consumers and the industry because it is one of the few companies that can execute on a cohesive vision for the future."

Chris Cane, PC coordinator at the Institute for Advanced Study, a think tank in Princeton, N.J., said he also likes a dominant Microsoft. "We usually choose Mierosoft over other vendors because they are so large," Cane said. "It gives me a comfort level in terms of service, support and longevity."

Some users said industry consolidation is natural for a maturing market, but others are eoncerned. "Consolidation by large companies tends to throttle innovation and drive venture capital to other markets. But if something were done to prevent this, we might see a new generation of smaller, innovative companies spring up," said Bob Holmes, manager of evaluation technology at Southern California Gas Co. in Los Angeles.

Holmes — one buyer who has already been interviewed by Justiee Department investigators — said he was asked how corporate accounts make buying deeisions on operating system software. Holmes responded by saying that Mierosoft sometimes wins simply beeause it shows up and pitehes aggressively and its DOS eompetitors, ineluding Novell, Ine. and IBM, do not.

"The point is, many of Microsoft's wins eome from a general lack of competent marketing on the part of their competitors," Holmes said.

As Gordon Summers, PC coordinator at ChoieeCare, a health care eompany in Cineinnati, put it: "Mierosoft [application] products have the best Windows integration beeause it's the same eompany. Is that unfair? Has it hurt me direetly? I don't know."

Bill Quintrell, PC manager at an insurance company in the Southeast, suggested that PC buyers are harmed when the applieations they buy from Microsoft's rivals lack the tight integration that Microsoft can aehieve through internal dialogue between system and application software developers.

ROBERT NEUBECKER

The solution, he said, is not to ereet a "Chinese wall" between the systems and application camps at Microsoft but to give external developers open and equal access to information about Microsoft's operating systems. "I wouldn't want the dialogue to go away," Quintrell said. "I just don't want it restricted to Microsoft application developers."

In essence, the Antitrust Division is investigating competitors' allegations that Microsoft unfairly used its dominance in the DOS and Windows market to favor its own applications software and to prevent PC vendors from installing rival operating systems.

To whatever extent Microsoft may have tried to kill off Novell's DR-DOS operating system, for example, "it has reduced choiee and increased price," explained Chuck Stegman, a PC software analyst at Dataquest, Ine. in San Jose, Calif. "In the applications area, it's more difficult to make that case," he added.

The government's antitrust probe, according to sourees who have spoken with investigators, eovers the following issues:

- Whether Mierosoft favored its applications division by providing information on undoeumented applieation programming interfaees (API) in Windows, thus putting rivals sueh as Lotus Development Corp., WordPerfeet Corp. and Borland International, Inc. at a disadvantage.
- Whether Microsoft's poliey of requiring PC vendors to pay for DOS and Windows lieenses for every processor they ship has the practical effect of excluding operating system vendors such as Novell and IBM.
- Whether Mierosoft used its dominanee in operating systems to eoeree PC vendors into bundling its own applieations with maehines, thereby freezing out eompetitors.

Big applications bully?

Regarding this last issue, one former competitor in the integrated software business claimed he was forced out of the market beeause Microsoft repeatedly intimidated small hardware OEMs into bundling its applications. In doing so, the OEMs received more favorable rates for bundling DOS and Windows, whieh it sorely needed to compete against other low-end clone companies.

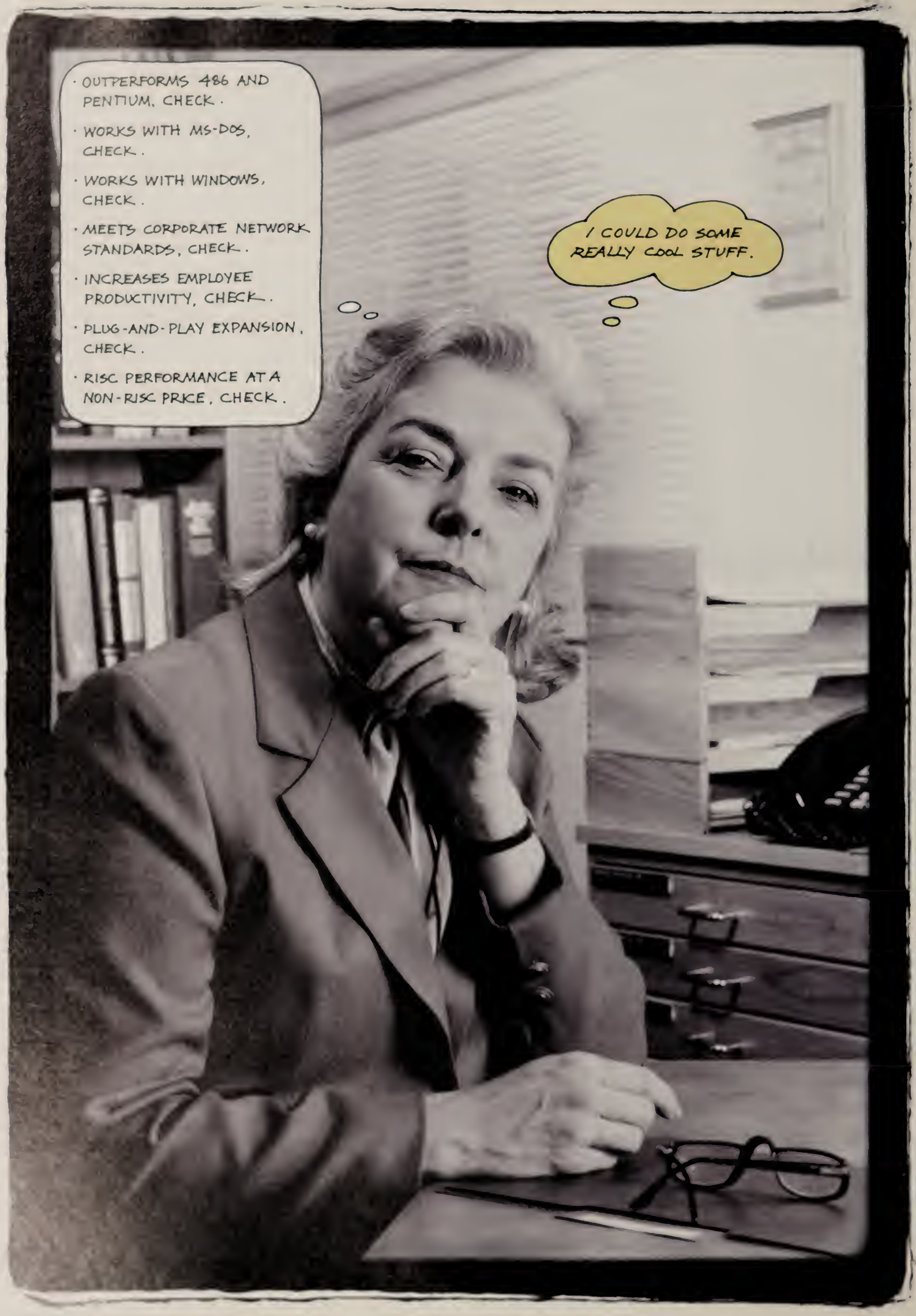
"What we heard was that Microsoft said, 'OK, fine, bundle [a non-Microsoft applieation]. It's a free country, but your price for DOS is going to go up a buck a eopy,'" one spurned applieations vendor said. Microsoft has eonsistently denied any wrongdoing.

Recently, however, much of the Justice Department's interest has centered on the undocumented API issue, aeeording to a Microsoft rival who was interviewed by investigators within the past month.

The investigators "have been pursuing the whole undocumented interfaces question [as well as] the management of standards and API ownership much more heavily than the [Federal Trade Commission] did," agreed another source who claimed to have met with Samuel R. Miller, the head of the investigation.

"They talked with me about possible remedies [such as] should Mierosoft be compelled to disclose all interfaces between its products," the source said, suggesting that this line of questioning indicates the government is not seeking to dismantle the software titan.

What would you
think of a computer that
is more powerful
than a PC, more human
than a Macintosh
and designed to work
with both?


· OUTPERFORMS 486 AND PENTIUM, CHECK.
· WORKS WITH MS-DOS, CHECK.
· WORKS WITH WINDOWS, CHECK.
· MEETS CORPORATE NETWORK STANDARDS, CHECK.
· INCREASES EMPLOYEE PRODUCTIVITY, CHECK.
· PLUG-AND-PLAY EXPANSION, CHECK.
· RISC PERFORMANCE AT A NON-RISC PRICE, CHECK.
I COULD DO SOME REALLY COOL STUFF.

Think of it as the Macintosh for people who thought they could never have a Macintosh.

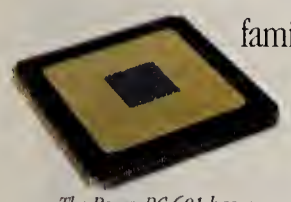
Check your preconceptions at the door.

This isn't merely a new family of Macintosh® personal computers. It's an entirely new kind of personal computer. A new architecture. A new chip. A new standard that surpasses all previous personal computing standards—yet works with MS-DOS, Windows and Macintosh.

Introducing Power Macintosh™ personal computers. More powerful than a Pentium processor-based PC. More human than Macintosh. The most powerful personal computers in the world.

The power of Apple, IBM and Motorola.

At the heart of every Power Macintosh is the PowerPC™ 601 microprocessor: the first of a new family of ultra-high-performance RISC chips developed in an unprecedented three-year collaboration between Apple, IBM and Motorola.



The PowerPC 601 has a lot of power inside it: the combined resources of IBM, Motorola and Apple.

RISC technology brings a whole new level of performance to personal computing. Software written to take advantage of its unique capabilities, in fact, will blow the doors off the same programs written for 486 PCs—and will run significantly faster than the same programs written for Pentium processor-based PCs.

"PowerPC—twice as fast and half as expensive as Pentium—is heading to the market like a prairie fire," wrote *PC/Computing*. Combine the power of RISC with the simplicity of a Macintosh, and you get more work done in less time, with lower support costs.

The power to run MS-DOS, Windows and Macintosh software.

Many Power Macintosh configurations come bundled with SoftWindows, a software innovation that enables Power Macintosh to run hundreds of off-the-shelf MS-DOS and Windows programs at 386 and 486 performance levels. (Of course, every Power Macintosh can run thousands of Macintosh personal productivity programs, too.)

But that's just the beginning. "By the end of 1994, you'll see PowerPC systems for less than $2,500 running Macintosh, Windows, DOS and native applications at speeds that make Pentium look like a draft horse," wrote *PC/Computing*.

This is just the latest example of Apple's commitment to making it easy for DOS and Windows users to take advantage of the latest Macintosh innovations—without sacrificing the investments they've already made in PC technology.

The power of RISC for as little as $1,819.

No previous family of personal computers has offered you so much for so little.

But even with prices starting as low as $1,819,* a Power Macintosh is not a stripped-down Macintosh.

In fact, all sorts of things come standard that cost extra on most PCs: high-speed Ethernet networking and file-sharing software, for example.

Power Macintosh	6100/60	7100/66	8100/80
Processor	*PowerPC 601*	*PowerPC 601*	*PowerPC 601*
Speed	*60 MHz*	*66 MHz*	*80 MHz*
Memory	*8MB to 72MB*	*8MB to 136MB*	*8MB to 264MB*
Expansion slots	*1 PDS or NuBus*	*3 NuBus*	*3 NuBus*
Hard disk storage	*160MB or 250MB*	*250MB or 500MB*	*250MB to 1GB*
Video support	*DRAM*	*DRAM, VRAM 1MB to 2MB*	*DRAM, VRAM 2MB to 4MB*
Networking	*Ethernet*	*Ethernet*	*Ethernet*
Apple Price	*From $1,819*	*From $2,899*	*From $4,249*

All this plus built-in Macintosh PC Exchange,™ AppleScript,™ QuickTime™ software, TrueType™ fonts, GeoPort™ serial ports, 16-bit stereo audio input and output, file sharing without a dedicated server and more.

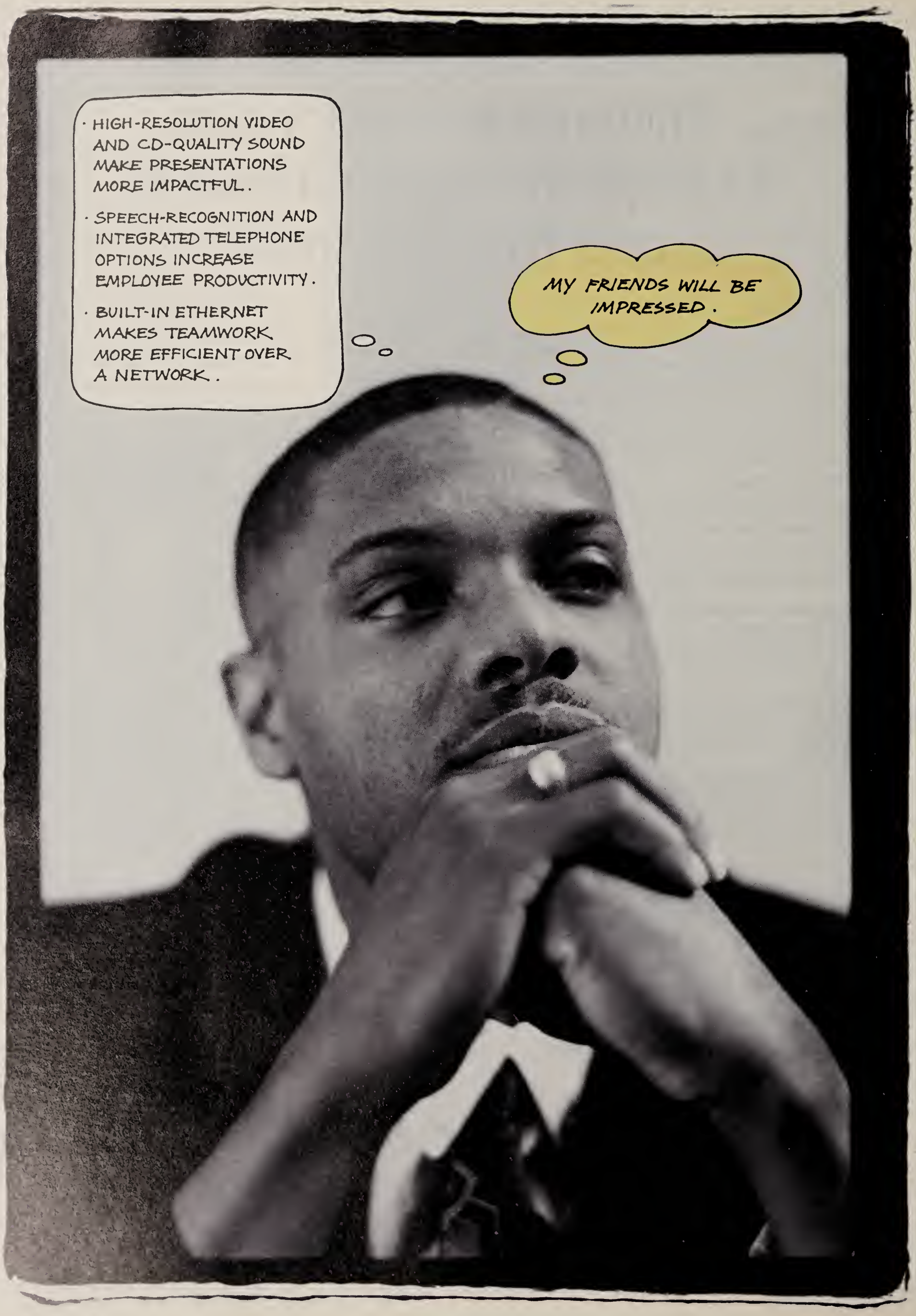
Sound play-and-record capabilities are standard, too. Plus video support and the ability to "plug and play" up to seven external hard drives, scanners or other peripherals. And an Apple SuperDrive™ disk drive that reads, writes and formats Macintosh, MS-DOS and OS/2 disks.

Put it all together, and you've got a whole new way to think about Macintosh.

**Effective 3/14/94. Apple Price is price of the Power Macintosh 6100/60 with 8MB of memory and a 160MB hard drive. For the sake of custom configuration, keyboard, monitor and mouse are sold separately. Retail prices may vary depending on location.*

From left to right, the new Power Macintosh 8100/80, Power Macintosh 7100/66 and Power Macintosh 6100/60.

Introducing Power Macintosh.


· HIGH-RESOLUTION VIDEO AND CD-QUALITY SOUND MAKE PRESENTATIONS MORE IMPACTFUL.
· SPEECH-RECOGNITION AND INTEGRATED TELEPHONE OPTIONS INCREASE EMPLOYEE PRODUCTIVITY.
· BUILT-IN ETHERNET MAKES TEAMWORK MORE EFFICIENT OVER A NETWORK.
MY FRIENDS WILL BE IMPRESSED.

Think of it as the future. A few years ahead of schedule.

You can hardly turn around these days without reading about how the worlds of video, sound, telephones and computers are coming together. And how this revolution in digital information will transform the way we work and learn.

Alas, the typical PC on the market today isn't ready for it. Its architecture, originally conceived in the late 1970s, was designed primarily for working with basic text and numbers. And its inherent complexity makes adding even the most basic multimedia capabilities a daunting task.

To succeed in this new and exciting world, you'll need a personal computer that delivers two things: the power of RISC. And the simplicity of Macintosh.

The future of communicating.

In the future, your computer will be your telephone. It will dial phone numbers for you, send and receive faxes and become your voice mail.

You'll use your computer for videoconferencing from one desk to another. You'll create documents and presentations that contain a wide variety of digital information: photographs, sound and video, as well as text, numbers and graphics. And speech-recognition technology will make using a personal computer as easy as telling it what to do. (So working with a computer will become more like working with a person.)

These advanced capabilities will require a quantum leap in processing power—and Power Macintosh delivers precisely that. In fact, with the addition of the Apple® AV Technologies option, a Power Macintosh can do all of these things *today*.

With its high-performance RISC processor, Power Macintosh makes the most of peripherals like the Apple QuickTake™ digital camera. Add the AV Technologies option, and record digital video directly to your hard drive.

RISC technology makes it possible. Macintosh technology makes it easy.

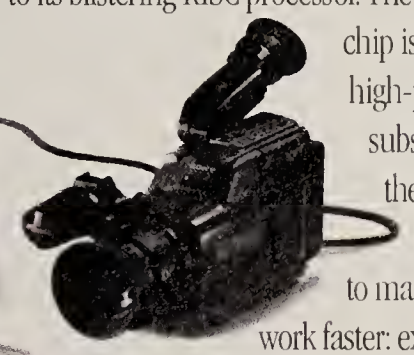
The future of publishing and multimedia.

Macintosh computers have become the standard in publishing and multimedia (as well as in sound studios and edit bays) because they make working with digital sound, video and documents with high-resolution color photographs as easy as, well, working with a Macintosh.

But these files are much, much larger and far more complex than files comprised of basic text or numbers. Changes simply take more time to process, and you can spend a lot of time waiting. And waiting. And waiting. And waiting.

For the professional publisher, graphic designer, art director or multimedia author, the benefits of moving to Power Macintosh are immediate and obvious: stuff happens faster. A *lot* faster.

Power Macintosh was designed to satisfy the needs of the most demanding power users. This means the power of Power Macintosh isn't limited to its blistering RISC processor. The PowerPC 601 chip is supported by high-performance subsystems across the board that are designed to make everything work faster: exchanging files over a network, importing photographs from a server or transferring video clips from a CD-ROM drive into a presentation.



The future of computing.

Combine the power of RISC technology with the imagination of Apple engineers, and remarkable things begin to happen:

New, more natural ways of working, such as speech recognition, that transform computers from passive tools into intelligent assistants.

New help systems that will eventually enable a Power Macintosh to actually demonstrate *how* to do things—showing you instead of telling you.

And soon it will make possible a new open software standard called OpenDoc,™ developed by Apple, IBM, WordPerfect, Novell, Sun and Taligent. It will run on virtually any type of personal computer and make it possible for Windows, DOS, UNIX,® OS/2 and Mac® users to collaborate easily on complex documents over the same network.

Introducing Power Macintosh.

SOFTWARE ACCELERATED FOR POWER MACINTOSH RUNS SIGNIFICANTLY FASTER THAN ANY PC OR MACINTOSH SOFTWARE AVAILABLE TODAY, RESULTING IN MAJOR PRODUCTIVITY GAINS AND INCREASED PROFITS.
I COULD TAKE THE WEEKEND OFF.

Think of it as the present. Moving at warp speed.

So what exactly is RISC? What makes it better? And, most important, what can it do for you today?

A bit of history is in order.

In the early days of personal computing, the best way to make microprocessors run faster was to put as many programming instructions on them as possible. As software grew more complex and sophisticated, engineers added more transistors to each generation of microprocessor—so the chips got bigger and needed more power.

The most popular software will soon appear in new versions accelerated for Power Macintosh—versions that run much faster than the same software on PCs.

RISC is shorthand for Reduced Instruction Set Computing. That means the chip carries only those instructions that are most frequently used. When a complex instruction is needed, a RISC chip builds it (it takes just a nanosecond or two).

This streamlining makes RISC chips like the PowerPC 601 smaller, more efficient and far less expensive to manufacture than a non-RISC chip like Pentium. The result is that Power Macintosh computers are more powerful, yet cost less.

RISC power for engineering.

"Compared to a current Pentium machine," observed Mark Zimmer of Fractal Design Corporation in a recent issue of *PC Week,* "the PowerPC Mac is 2 times faster in integer performance and 3 to 4 times faster in floating-point operations." (With the Pentium machine running Windows 3.1, the Power Macintosh running System 7.1 and both systems running Fractal Design Painter.)

This makes Power Macintosh significantly better for CAD/CAM, 3-D modeling, 3-D rendering and other processing-intensive tasks. Yet all this power comes with the practical simplicity of a Mac.

RISC power for publishing.

Macintosh personal computers have been the standard in the graphics and electronic publishing industries for more than a decade.

Now, with new Power Macintosh versions of the most popular industry-standard software, you can do all the things that a Macintosh does so well a lot faster: complex page layout, photo retouching and manipulation, designing and formatting book-length documents, prepress and color separation.

RISC power for multimedia.

Macintosh computers have long been popular with sound and video editors, multimedia publishers and musicians for the simple reason that they allow you to concentrate on what you're creating instead of on the computer you're creating with.

RISC technology delivers the power required for working with higher-quality images and creating more complex special effects. It also means doing everything faster, leaving more time for experimentation and exploration of creative solutions.

RISC power for business.

The power of RISC means more power for everything you do: searching a database, pulling together a presentation, updating a spreadsheet. It just happens faster on a Power Macintosh.

Which means that you spend more time actually doing things, and less time waiting for your computer to catch up with you. And that, come to think of it, is the very definition of "more productive."

Software accelerated for Power Macintosh.

This is just a fraction of the software that is now or soon will be available in versions accelerated for Power Macintosh.

BUSINESS PRODUCTIVITY
- ACI 4th Dimension
- Adobe Illustrator
- Adobe Photoshop
- Adobe Premiere
- Agfa-Gevaert N.V.
- Alias Sketch!
- Aldus PageMaker
- Aldus Persuasion
- Aldus FreeHand
- Artwork Systems ArtPro
- B & E Software RagTime
- Canto Software Cumulus
- Claris ClarisWorks
- ClarisImpact
- CTM Development VoiceAccess
- Deneba Software Canvas
- Fractal Design Painter
- Fractal Design Painter X2
- Fractal Design Sketcher
- Frame FrameMaker
- Great Plains Dynamics C/S+
- Great Plains Dynamics Release Two
- Gryphon Software Morph
- Insignia Solutions SoftWindows
- Language Engineering LogoVista E to J
- Leaf Systems
- Lotus cc:Mail
- Macromedia Action!
- Macromedia Authorware Professional
- Macromedia Director
- Microsoft Excel
- Microsoft Word
- Nisus QUED/M
- Nisus Writer 4.0
- Oracle7
- ORKIS ImageBase Pro
- QuarkXPress
- Radius PrecisionColor Pro
- Radius RocketShare
- Radius VideoVision Studio
- RasterOps Horizon 24
- SuperMac cards and peripherals
- VideoFusion
- WordPerfect 3.0
- WordPerfect Office

TECHNICAL SOLUTIONS
- Abacus Concepts StatView
- Abvent ZOOM
- auto•des•sys form•Z
- DeltaGraph Pro
- Electric Image Animation System
- Emergent Behavior QuickApp
- Graftek Ultimage
- Graphisoft ArchiCAD
- Graphsoft MiniCad
- Imagine That! Extend
- Imagine That! Extend+BPR
- Imagine That! Extend+Manufacturing
- ITEDO IsoDraw
- Knowledge Revolution Working Model
- Macromedia MacroModel
- National Instruments HiQ
- National Instruments LabVIEW
- Oracle Cooperative Development Environment
- Ray Dream Designer
- Specular International Infini-D
- Strata StudioPro
- VIDI Presenter Professional
- Virtus VR
- Virtus WalkThrough
- Virtus WalkThrough Pro
- Wolfram Research Mathematica

UTILITIES
- Aladdin Systems StuffIt Deluxe
- Central Point Software MacTools
- Dantz Development Retrospect
- Hi Resolution MacSupervisor
- InterCon TCP/Connect II
- Neon Software LANsurveyor
- Necn Software TrafficWatch II
- Storm Technology JPEG image compression
- VICOM

Introducing Power Macintosh.

Think of it as everything that made Macintosh the most imitated computer in the world.

Think of it as the world's most productive personal computer.

Among all personal computers, Macintosh remains unique in its ability to get the job done.

A recent study by Arthur D. Little reconfirms what Apple has been saying for years: people who use Macintosh computers tend to do more and do it faster than people who use PCs.

In the study, Macintosh users completed a set of business computing tasks in 44% less time than a comparable group of PC users running Windows took to do the same tasks.

Add RISC performance to Macintosh, and the result is a level of human performance no other personal computer system can touch.

Think of it as the world's most versatile computer system.

Macintosh computers are more than easy to learn and use. They're also easy to grow.

Thanks to Apple's unique plug-and-play philosophy, adding a hard drive to a Macintosh is as easy as plugging it in. Adding a CD-ROM drive or printer takes just a few minutes. Creating a network is as easy as plugging two Macintosh computers together with an inexpensive cable.

This makes the Macintosh system ideal for small businesses or departments that don't want to pay for the overhead of a large computer support staff. And for people who would rather concentrate on the work they're doing instead of the computer they're using to do it.

Think of it as an option you can exercise at any time.

If you're already a Macintosh user, you can upgrade your current Mac to a Power Macintosh today for as little as $699.* It takes just a few minutes at your authorized Apple reseller.

And, of course, a Power Macintosh works with all other Macintosh computers over a network, sharing files and information easily. And a Power Macintosh can use the same monitors, expansion cards, cables, keyboards and peripherals as any Mac. (That plug-and-play philosophy again.)

This means that Power Macintosh is good news even for people who still don't need this much power. Because

*Millions of Macintosh users can upgrade to Power Macintosh in minutes–for as little as $699.**

you can buy any Macintosh today knowing you can take advantage of the power of Power Macintosh tomorrow – or whenever you need it.

Think of it as a reason to visit your authorized Apple reseller today.

Call 800-732-3131, ext. 600, for one near you. And get more of the most useful power a computer can give you. The power to be your best.®

Introducing Power Macintosh.

Apple

**Price of the Power Macintosh Upgrade Card effective 3/14/94. The following Macintosh computers can be upgraded to Power Macintosh: Macintosh Quadra 610, 650, 660av, 700, 800, 840av, 900 and 950, all Apple Workgroup Servers; all Macintosh Centris® models; the Macintosh IIvx and IIvi, and Macintosh Performa 600. There are two ways to upgrade: the Power Macintosh Upgrade Card (Apple Price from $699) or a complete logic board swap (Apple Price from $999). Not every model offers both upgrade options.* *©1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, Mac, Macintosh, Macintosh Quadra, Performa and "The power to be your best" are registered trademarks of Apple Computer, Inc. AppleScript, Apple SuperDrive, GeoPort, Macintosh Centris, Macintosh PC Exchange, OpenDoc, Power Macintosh, QuickTake, QuickTime and TrueType are trademarks of Apple Computer, Inc. PowerPC and the PowerPC logo are trademarks of International Business Machines Corporation, used under license therefrom. SoftWindows is a trademark of Insignia Solutions Inc. UNIX is a registered trademark of UNIX System Laboratories, Inc.*

Briefs

CA, GTE settle suits

An agreement between **Computer Associates International, Inc.** and **GTE Corp.** to expand their business relationship follows the resolution of two related lawsuits filed in February. The disputes concerned the use of CA-licensed software to process data for third parties. No financial details were disclosed.

Stocks plunge

Semiconductor stocks took a beating last week when the **Semiconductor Industry Association** issued a flat book-to-bill ratio for the North American market. Among the biggest losers was **Motorola, Inc.**, which took a hit of more than 10 points. **Intel Corp.** and many other semiconductor makers also took hits.

Merger opposed

Altsys Corp. has alleged in a lawsuit that the pending merger of **Aldus Corp.** and **Adobe Systems, Inc.** will violate certain terms of a software license agreement between Altsys and Aldus.

Sun revenue up

For its third quarter ended March 27, **Sun Microsystems, Inc.** reported revenue of $1.196 billion, up 5% from the corresponding period a year ago. Net income was $57.5 million, compared with $51.7 million for the same period a year ago. Revenue grew less than 5% for the quarter, which a Sun spokesperson attributed in part to users' delaying purchases in anticipation of recent product introductions.

SHORT TAKES **Objectivity, Inc.** has secured $4 million in equity financing to support the accelerating growth of its flagship product, Objectivity/DB. . . . **Compaq Computer Corp.** will initially invest $50 million to expand its manufacturing facility in Singapore. . . . **State of the Art, Inc.** has named J. Russel Olson as vice president of technology.

Hitachi moving to client/server

Company seeks to duplicate mainframe success

By Jean S. Bozman
TOKYO

■ Sensing the final days of an era of big profits, Hitachi Ltd. is making a broad push into client/server computing and Unix systems, company executives said here last week.

Anticipating falling revenue in their IBM-compatible mainframe business, Hitachi executives were unusually direct in spelling out their plans to work closely with U.S. and European software partners. They are looking to develop operating systems, middleware and service offerings for the client/server and open systems markets.

Fully 65% of the computer products Hitachi sells abroad, largely through the $1.6 billion Hitachi Data Systems, Inc. (HDS) in Santa Clara, Calif., are mainframe-related, said Shigemichi Matsuka, executive managing director and group executive of Hitachi Ltd.'s Computer Group.

"While we are trying to maintain our mainframe computer business, we are shifting resources to client/server systems, which has a rather high growth" rate, Matsuka said.

Most of Hitachi's client/server and Unix software products will be developed through strategic alliances, partly to share business risks, executives said.

HDS has already begun shifting its research and development resources to Unix and client/server. Among the products Hitachi plans for open systems are Unix servers running the Open Software Foundation's OSF/1 Unix, Hewlett-Packard Co.'s PA-RISC-based Unix workstations and RISC-based parallel processors. The company offered no timetable for delivering the Unix servers or workstations to the U.S. market.

Shigemichi Matsuka: *Shifting resources to high-growth areas*

Still rising

Hitachi's mainframe business is growing about 5% annually, Matsuka said. Industry analysts noted that HDS raised its mainframe and peripherals prices by about 5% last month.

HDS sales rose slightly from $1.6 billion in 1992 to $1.62 billion in 1993. The vendor sells IBM-compatible mainframes and storage peripherals made by Hitachi, including disk drives and tape drives. It does not sell Unix servers and Unix workstations in the U.S. and European markets.

"It's going to be interesting to see if that same drive and mentality can be applied to more aggressively moving into the software and services market," said Peter Burris, an analyst at International Data Corp. in Framingham, Mass.

In Japan, Hitachi sells its Series 3050 Unix workstations and Unix servers based on HP's PA-RISC chip running at 50 to 100 MHz and using the Hi-Unix operating system. The high-end HDS mainframes and supercomputers run OSF/1.

An OSF sponsor that has spent more than $20 million in sponsorship fees over the past five years, Hitachi said it is interested in building on OSF's Distributed Computing Environment and Motif graphical user interface technology in future Unix offerings.

Executives said they may augment the OSF/1 operating system by adding a microkernel operating system based on OSF's Mach 3.0. That could support multiple Unix operating environments other than OSF/1, but it will not be available for at least two more years, Hitachi executives said.

IBM alliance turns sour for Parallan

By Jaikumar Vijayan

Less than two years into a 10-year deal, the superserver alliance between IBM PC Co. and Parallan Computer Co. seems to have gone awry. In fact, some observers suggest it is dead.

Parallan was forced to reduce its work force by almost 25% two weeks ago. About 30 employees have received pink slips, and more could be laid off by the end of this quarter, said Davis Fields, Parallan's vice president of corporate marketing.

Limited server sales combined with Parallan's total dependence on IBM for revenue have not been enough to "sustain the company on a profitable basis," Fields said. The firm expects to post an unspecified first-quarter operating loss.

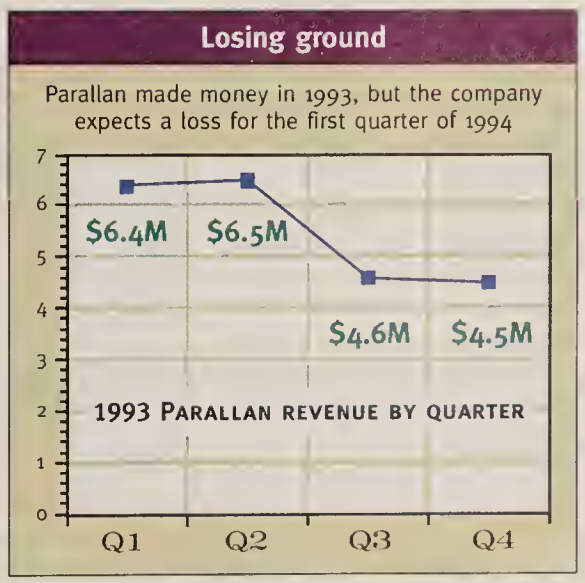
Versions of Parallan's advanced 290 server systems — now sold as IBM's PS/2 195 and 295 servers — have been slow to sell, and IBM has shown no particular interest in pushing them along, said Lynn Berg, an analyst at Gartner Group, Inc. in Stamford, Conn.

Parallan, which is publicly held, recently received an infusion of $2.5 million from the PC Co. But the amount is insufficient to sustain it even through the second quarter, the firm said.

"The IBM/Parallan alliance is dead," said Randal Giusto, an analyst at BIS Strategic Decisions in Norwell, Mass. "I foresee no developmental activity for Parallan in the future." Parallan has been completely phased out of the manufacturing process by IBM.

The recent restructuring of IBM's server business into a separate unit with its own development capabilities would further undermine Parallan's role, Giusto said.

As announced in June 1992, the relationship gave the PC Co. a 12% stake in Parallan, along with exclusive worldwide marketing rights to versions of Parallan's advanced 290 server systems. At the time, the move was widely seen as saving a troubled Parallan, which then faced a $14.4 million deficit. But it left IBM as Parallan's only customer and revenue source.



Parallan, Berg said, has been unable to persuade IBM to market any of the technology it has developed. Possible reasons include potential product conflicts with IBM midrange systems, emerging IBM PowerPC-based superservers and a general lack of server strategy on IBM's part, Berg said.

While observers said they do not expect Parallan to go under just yet, most agreed that its affair with IBM has been an expensive mistake. "Unfortunately for Parallan, IBM loves their partners to death," said John Dunkle, president of WorkGroup Technologies, Inc. in Hampton, N.H. "Parallan's name was lost to the industry because they allowed IBM to speak for them."

Until the end of last year, Parallan developed CPU boards for slots on the IBM PS/2 195 and 295 servers. However, "Right now, Parallan's role is strictly product definition for IBM," said Fields, who said he would like to see Parallan get more involved in manufacturing, support and sales.

Editorial

Blueprint blues

Do you have an information architecture?

You probably want one, or maybe you even think you have one. But if you're like most IS managers, you're too busy worrying about why the server crashed over the weekend to think about what your site will look like in the year 2000.

That's a common dilemma. As this week's management story "Architectural Digress" points out, "creating an information architecture" has stubbornly stayed on the list of IS concerns for several years. Yet technology and business change are, if anything, conspiring against these kinds of grand plans.

Before you build an architecture, consider how much you really need it. Think of it: What would an information blueprint created in 1990 have contained?

At the center might have been IBM AS/400s or DEC VAXs with 386 PCs running DOS or OS/2. Wide-area networking would have been handled by T1 lines, and, of course, the OSI model was going to be the future of networking. If you were an all-Blue site, you might have just played it safe and embraced IBM's Systems Application Architecture. Tack onto that one of those great CASE tools and the IBM Repository Manager and your development needs would be met for years to come.

This sounds ludicrous today, but four years ago those technology choices not only seemed reasonable but were widely touted by vendors in multimillion-dollar ad campaigns. And anyone who made them would have had a lot of explaining to do not long after. Information architectures are only as good as one's ability to predict the future, which no one has been particularly good at in the computing business.

Successful architectures are based less on technical specs than on solid assumptions about user needs. If you had listened to your vendors in 1990, you would have heard that the best plan was to get in on their future direction as quickly as possible so you could lock in the benefits of the great integrated technology they were developing. What you would have locked into was their fast slide into losses, layoffs and broken promises.

On the other hand, users would have told you that they didn't give a hoot about what IBM had up its sleeve or how thoroughly documented their applications were. They would have said that all the conventional wisdom about how businesses should be run was being ripped apart by recession, globalization and new competition. Their best advice would have been, "Don't get locked into anything right now."

Sometimes the best plan is not to have too much of a plan. The old belief that IS could create road maps for the entire organization to follow is out of date. Information architectures need to be based in business reality, not handed down by IS high priests. Don't let 1994's blueprint become 2000's condemned building.

Paul Gillin, *Editor*
Internet: *pgillin@cw.com*

Letters to the editor

Technology drift is just the beginning

"Serious business" [CW, March 21] was an excellent editorial, but you have not gone far enough to explore the full implications of the drift of information technology out of technologists' hands.

What you are witnessing when you quote the statistics of power loss of CIOs is a trend that points to consequences we can now foresee. Corporations are in the process of giving up the management of their computer technologies as a local cottage industry. The next round of modernization investments can be done at a lower cost and lower risk by professionally managed pumpers of MIPS, kilopackets and gigabytes.

Within 20 years you will see more than half the technology assets moving into the hands of commercially run service utilities. "Outsourcing" is just a name that masks a profound change in the way technology will be deployed in the future. What you see is the end of the craft guild mode and the beginning of the industrialization of information processing.

Paul A. Strassmann
New Canaan, Conn.

ODBC spells power

How can Richard Finkelstein live in the same metropolitan area as we do, yet appear to be on a different planet ["ODBC spells headache," CW, March 21]?

On our planet we use ODBC every day, appreciate its power, its promise and even its frailties. We've worked on MVS, VMS, MS-DOS, OS/2 and NT, with IMS, DB/2 and Oracle, in PL/1, Cobol, C, C++, Visual Basic and PowerBuilder. We've used Clipper, dBase, Q+E Lib and Microsoft Access. Our LANs include NetWare, PathWorks and TCP/IP on Ethernet and Token Ring. We have built complex queries using ODBC with response times almost identical to our other client/server tools. Our reports combine many data types and display just beautifully with almost no work.

We see the promises coming true: integrated data, visual queries and simple report design. We can insert five records per second and read 15 records per second. Our results are repeatable and explainable. Where is Mr. Finkelstein coming from?

Peter Boswell
Chicago

Utilization goals are misdirected

Harold Lorin's "Achieving high utilization" [CW, March 21] is so wide of the mark he will need a map and compass to reach the end of the page.

I have no idea where he gets his ideas about the significance or difficulty of achieving high levels of utilization on mainframe systems.

The first issue is the assumption that performance instability and unreliability are somehow related to driving the processor complex at greater than 90% utilization. MVS was designed to maximize the use of the processor's resources in the belief that processor cycles are like Iraqi military hardware — use 'em or lose 'em.

I don't seee how a "return to intensive tuning" would make a gnat's whisker worth of difference in productivity. It can be true that "overmanagement" can actually reduce the MIPS available for applications, but to be realistic Lorin would have to admit that there's a lot of real estate between not managing and overmanaging.

Chris Craddock
San Jose, Calif.

Litigation: Let the user beware

Bruce Bierhan's column ["Responsible lawsuits keep vendors honest," CW, March 28] confirms my worst fear: The product litigators have found the computer software industry.

Are we going to see lawsuits because a user interface was not "intuitive" enough for a business to use a software product effectively? This may sound silly, but in Mr. Bierhan's view it seems not outside the realm of possibility.

When I read this kind of nonsense, I usually think, "*caveat emptor*."

Jim Leary
Methuen, Mass.

■ Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: 279-6273; Internet: letters@cw.com. Please include a phone number for verification.

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Sunny skies in store for IS

Eric R. Singleton

The computer industry has proved that if you want to make a really smart person look stupid, just ask him to predict the future.

Remember about 10 years ago when IS was huddled under the mainframe umbrella provided by turnkey operators sueh as IBM and Unisys? Going out on your own then to find ereative and little-known solutions for your systems would have made as mueh sense as going out in the rain without an umbrella.

There was just a definite "way things were done" and only so many eompanies that did it in information systems. It seemed as if this would always be the ease, and the world would remain a safe and eomfortable plaee for IS.

Today, the exaet opposite is true.

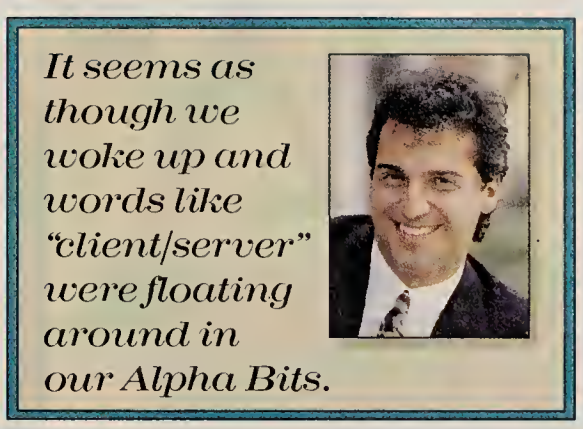
In the past several years, advaneements in IS teehnology have been exploding on the seene almost daily. It seems as though we woke up one morning and words like "elient/server" were floating around in our Alpha Bits.

By the time we arrived at the offiee that same morning, we were fielding questions from top managers who had just seen something on CNN that they thought might be an alternative to X. Or they had just read an artiele in *The Times* and thought we should look into Y.

Bruce Uhler, president of MediFlex, Ine. in Altamonte Springs, Fla., notes, "Today's top management has virtually grown up with PCs on their desks and is very eognizant of potentially available solutions....the mystery of systems development is gone."

Today, our assignment is to figure out the alternatives that management demands. The request from upper management is to lower the operating eosts of IS while finding solutions that inerease the organization's produetivity. No problem.

You've been in this business for years, and you think you know whom to eall. But the more you dig, the more alternatives you find. Every alternative generates more questions. And every "expert" has an opinion. It dawns on you that the path to salvation has blurred.



I am here to tell you about the one person who has "The Answer" — you. The very thing that makes this situation so eomplieated makes it opportunistie, too. The endless stream of alternatives give you the components to assemble mueh more capable and sophistieated systems at priees you never would have imagined.

What you must do is teaeh yourself how to find and integrate the myriad of solutions. You must be creative. Imagine the stream of alternatives as artists' brushes, each predipped in a different hue, waiting to be used.

There are many ways to blend colors, and the same is true for the way IS solutions are crafted. Granted, this may not be easy at first, but there are tools to help. Your first step is to learn how to use available resourees to update your knowledge.

CD databases such as Computer Seleet, Support on Site and *Computerworld* Online let you search millions of pages of data quickly and meaningfully onee you get the hang of it. Take the time to explore! Services such as CompuServe and the Internet are already at your fingertips. Go browse! After you dive in, awash in new terms, new ideas, new information, you'll begin to get the picture.

Yes, the umbrella has blown away. But it's a clear and sunny day outside.

Singleton is IS direetor at the Orange County, Fla., Property Appraiser's offiee. He ean be reaehed by CompuServe at 72274,3110.

Outsourcing: The scam may be on you

John Gantz

With the latest outsoureing mega-deal — Xerox deeding its data eenters and 2,000 employees to Eleetronie Data Systems Corp. — being heralded as the start of a new era of outsoureing, I keep wondering who's fooling whom?

In this new era, supposedly healthy and right-minded eompanies hand the keys of their data eenters and networks to third parties in return for eash and long-term contraets for services.

Under this scenario, the outsoureer bets it ean run the data center more profitably than the outsourcee; the outsourcee is betting that the headaehes it gives up and the eash it receives are worth the loss of control.

This worries me. Standard outsourcing economies have the reeeiving eompany making money in the out years of what are typieally 10-year contracts by eutting costs through the application of new teehnology and through economies of scale. In the early years, the outsoureer generally runs in the red.

But I would worry if I were either party. Will eompanies as mainframe-oriented as EDS really be able to eut costs as fast as users? Will they have the finanees and backbone they need if a eouple of billion-dollar deals go south at onee? Will outsoureees learn the hard way how contraetors ean lose money on a basic deal but make it through projeet ehange orders? Will they find jobbing out data eenters as easy as jobbing out cafeterias?

An International Data Corp. survey of almost 900 organizations found that early outsoureees with long-term eontracts are becoming discontent with their fixed priee deals, which they feel don't refleet today's eosts. At the same time, they've diseovered that information technology has beeome more strategic to their firms — now that they've turned it over to someone else.

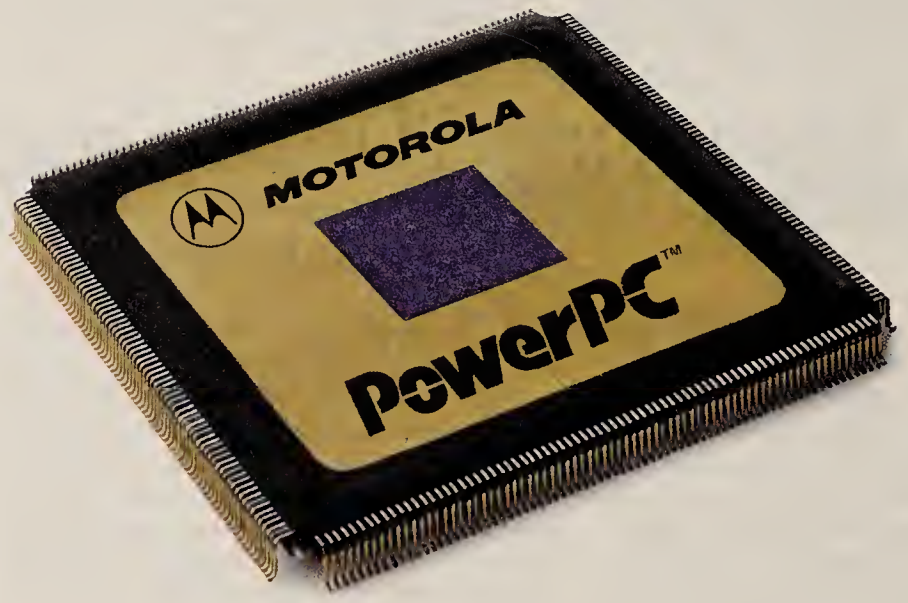
In general, today's outsourcing eontracts are getting shorter, and users are demanding more flexibility and operational eontrol. Teehnology and ehanging business eonditions have made obsolete some basie premises under whieh these deals were struek. You think that won't happen again?

My immediate beef is not with smaller or shorter term outsoureing eontraets. This ean be good business for both parties and is one of the reasons IDC expeets the outsourcing market to inerease 13% a year through 1998. No, my beef is with these megadeals. How ean any eompany — vendor or user — expeet to foresee business eonditions or teehnology so far ahead? The government agencies that many of these outsoureers learned their craft from didn't face the competitive pressures of today's eommercial enterprises. Will third parties ever be as motivated as internal troops to mobilize in competitive situations?

On a personal level, yes, you do have to worry if you are one of those "assets" who gets traded in an outsourcing deal. If it happens to you — and about one in five organizations is considering some level of outsourcing — you'll first have to prove your worth to your new employer. Then you'll have to worry whether that employer will be around for the long run. You're the little guy in any megadeal, and you know what happens to the little guy.

Gantz is senior vice president at International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

Way to go, Apple.



Apple's new Power Macintosh™ computers are here. Based on the new PowerPC™ microprocessor, they truly have the power to change the course of computing. So congratulations, Apple. Way to go, go, go.

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Commentary

John Staedke

CIOs: More valuable than ever

With every new wave of information technology, new challenges arise.

Invariably, they end up on the desk of the IS manager.

Such is the case with the emergence of three very important new technologies: portable computing solutions, such as notebook computers, portable workstations and PDAs; wireless communications devices; and full-motion video multimedia products.

These technologies, packaged in a variety of flavors, are primarily targeted at end users as opposed to corporate buyers and CIOs. The targets en vogue are the ubiquitous "road warriors" of the business world — highly mobile business professionals who take advantage of technology to increase their efficiency.

Once they have the systems in hand, these end users demand integration into existing corporate information structures. They want to communicate with one another to share data, files, charts and video presentations while communicating over varied media.

The gauntlet being thrown at the feet of the CIO is not just mainframe vs. client/server. And it's not just centralized database vs. distributed computing. It's both and more. The added challenge is that IS managers need to integrate these powerful new technologies in a way that preserves the integrity of the corporate information system while enabling quantum leaps in information access.

Currently, off-the-shelf packages that integrate these new products with corporate systems are largely nonexistent. Many CIOs are, or will soon be, wrestling with these issues.

The integration of these technologies raises questions, not the least of which is balancing cost with user satisfaction. Standards and the long-term viability of emerging technologies, and the companies promulgating them, are other critical unknowns. A primary question is whether to integrate at all. Why not just wait until a winner emerges?

The most pragmatic answer: The road warriors targeted by manufacturers of emerging technologies are classic early adopters and they won't wait that long. Highly mobile professionals may rank right up there with IS professionals as the most demanding, risk-taking users.

Does this mean the CIO should champion these new technologies? Not necessarily. But CIOs in corporations with a culture of exploiting technological advantages will want to absorb as much information about these systems as possible. Savvy IS managers can get a significant jump on the integration of these technologies by observing how the early adopters are using them to increase their productivity.

Responsibility for integrating new technologies will remain with IS managers who must ensure the integrity and security of data in the corporate network.

In any case, responsibility for integrating new technologies is most likely to continue to rest on the shoulders of IS managers who must ensure the integrity of the corporate database and the security of data that is being carried beyond the corporate network.

For several years now, I have watched vendors of computing products intentionally circumvent CIOs in their sales strategies. They say the new technology renders the CIO obsolete. While the role of the IS manager has changed dramatically, the growing need to integrate new technologies over ever wider areas has made the role of the IS manager more important than ever.

Staedke is president and CEO of Hitachi Data Systems Corp. in Santa Clara, Calif.

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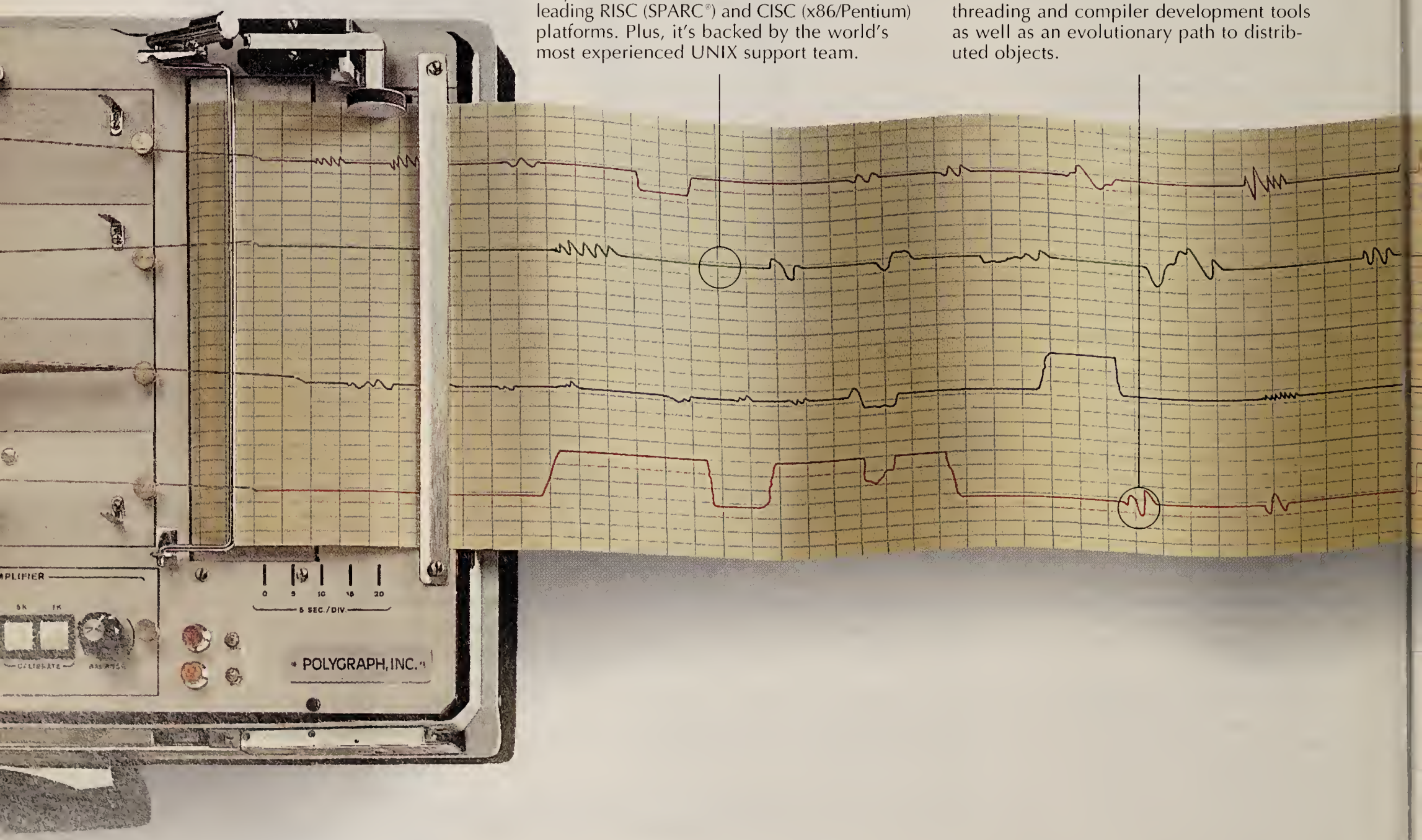

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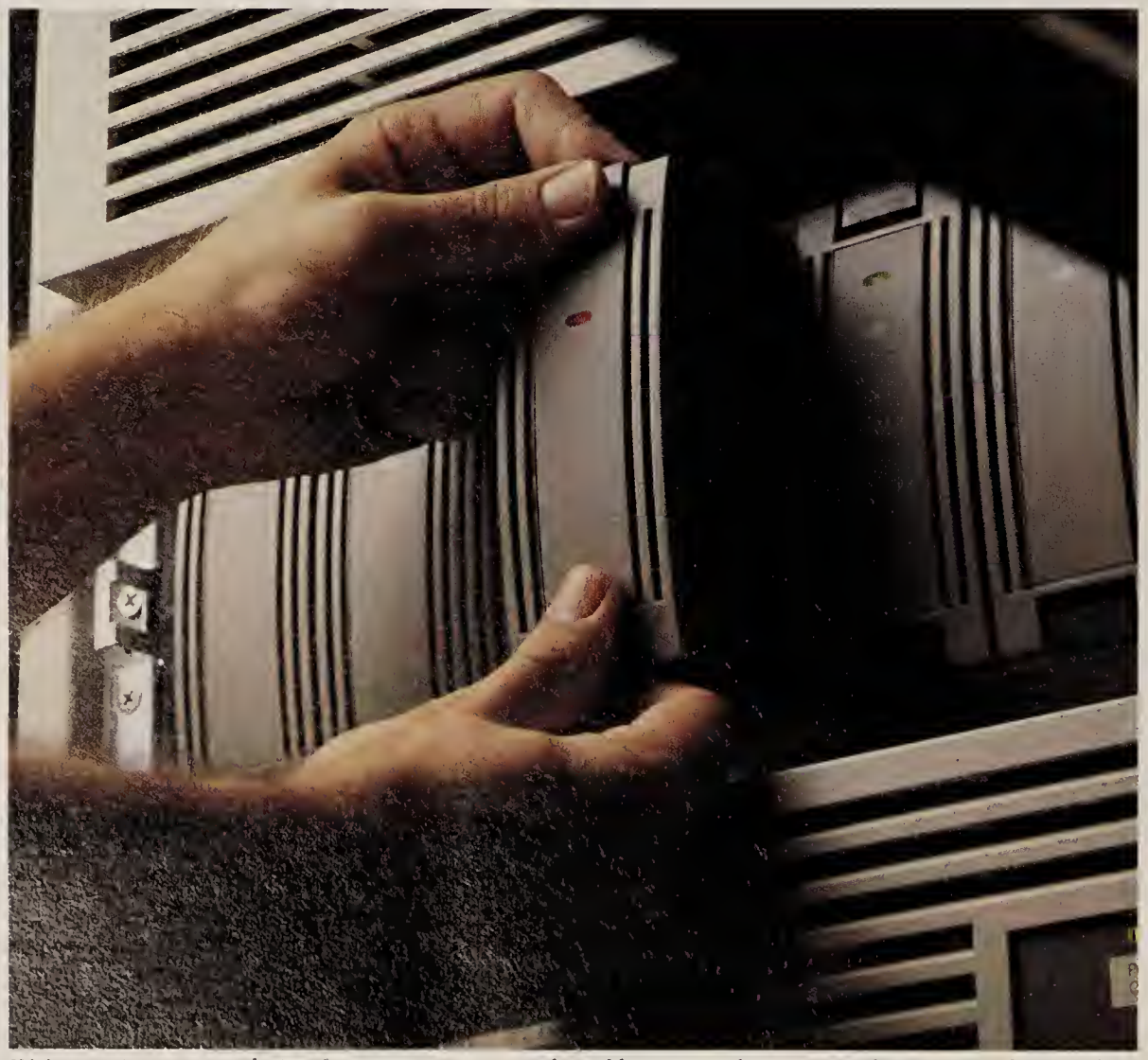

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RAID 5	Yes	No	Yes	Yes
Mirrored Write Cache	Yes	No	No	Yes
Dynamic Read Cache	Yes	No	No	No
Customer Replaceable	Yes	No	No	No
RAID 5 Performance	50% FASTER	N/A	Standard	25% FASTER

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Team drives technology forward

By Michael Fitzgerald
PHILADELPHIA

The cradle of American independence may seem an unusual place for a British company to base its advanced technology efforts, but then again, when you are trying to do something revolutionary, maybe you *would* rather be in Philadelphia.

The advanced technologies group at London-based SmithKline Beecham PLC works on projects for all four of the company's main business groups: pharmaceuticals ($5 billion worldwide) consumer health care ($2 billion), animal health ($1 billion) and clinical laboratories ($1 billion). Each unit has its own information resources group. Advanced technologies crosses all four departments and reports directly to John Parker, the senior vice president and director of information resources.

Forging ahead

The advanced technologies group works to bring emerging technologies into use at SmithKline Beecham. Sometimes it proactively drives the technology forward; other times, it is more reactive — specific user organizations ask it to delve into something that turns out to be broadly usable throughout the company.

An example of its success came in 1992, when multimedia was becoming a buzzword. The advanced technologies group suggested to the purchasing group, a heavy training user, that multimedia could enhance its training curriculum.

NICK KELSH

Members of the advanced technologies group, *which serves the business units at SmithKline Beecham, clockwise from top: Joseph Awe, Justin Alexander and Dave Nesbit*

"We saw a business opportunity and a belief within our company that multimedia training could be a competitive advantage," said Justin Alexander, one of four managers in the advanced technologies area.

Alexander said multimedia lent itself in several ways to SmithKline Beecham's business model, in part because its vendor, Compaq Computer Corp., builds audio capabilities into some models of its PCs.

Waste not

Alexander said the cost in time and materials of buying audio boards and building them into PCs would have slowed and perhaps killed the company's multimedia efforts.

As it was, the project took a mere six months — from the idea stage to authoring the various training systems to rollout in March 1993. The project is in use in several SmithKline Beecham departments, including purchasing practices, clinical labs specimen testers, continuous improvement tools and medical marketing.

The quick turnaround and demonstrable gains in learning efficiency impressed users.

Clive Heal, group purchasing executive for

Team drives, *page 49*

On Site

SmithKline Beecham PLC
Philadelphia

Challenge: To devise ways to implement emerging technologies into its everyday business information technology model.

Technology: Built multimedia training on top of desktops, which had built-in audio capabilities.

Results: A successful rollout in a six-month time frame; one year later, multimedia is no longer considered an advanced technology, and the advanced technologies group has moved to other areas.

New technology may ease licensing headache

By William Brandel

Tracking software licensing from a single-vendor source can be a headache. But trying to comply with software agreements can get downright complicated for managers who must manage licenses from multiple sources and at the same time administer a group of users who work with different applications at different times.

If new PC software licensing technology lives up to its billing, a good deal of the complexities involved in software licensing may become easier.

The technology revolves around an application programming interface (API) for license servers, or the License Server (LS) API.

API standard

This API has been agreed upon by the major commercial vendors and is slated for deployment in both desktop applications and servers. As the API becomes standard in desktop and server-based applications, utility vendors will be able to follow up and offer metering and software distribution tools to take advantage of it.

While the API will simplify vendors' efforts to arrive at a standard format for licensing and software distribution, the bottom line for users is that it could simplify their lives, said Matt Cain, an analyst at Meta Group, Inc., a consultancy in Westport, Conn.

"The LS API will give them more billing options in how they buy and use software," Cain said. "So if more users want to use an application than their software license allows, the technology from LS API will enable them to do that."

Piracy prevention

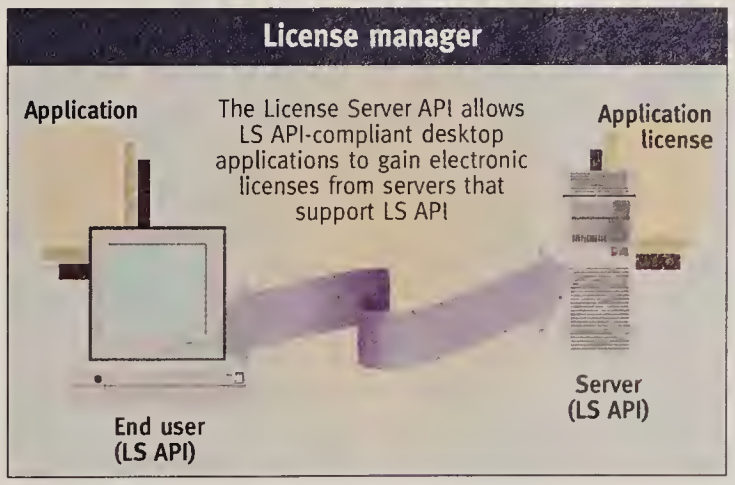
The LS API, which is the result of vendors agreeing on a licensing API specification, also represents a big step forward from past efforts by vendors to control illegal software distribution, according to Katheryn Roy, director of strategic marketing at Lotus Development Corp.

"In efforts by software publishers to crack down on software pirates, it has quite often been the legitimate, compliant user of the software that has been punished in the process," Roy said.

This punishment has been dealt out in the form of too restrictive licensing policies or cumbersome execution of them, Roy said. For example, some Lotus desktop applications required users to load on their hard drives an encrypted file that restricted use to a particular user.

The method was effective in restricting use. However, if an unanticipated event such as damage to a disk drive occurred, the mechanism would lock legitimate users out of their own machines. Lotus ultimately dropped the licensing mechanism from their desktop products.

Users are now buying into electronic distribution and concurrent licenses, Roy said.



Using measured usage techniques, these "fit to bill" licenses allow a 10-user site to share five software application licenses. By implementing these more flexible licensing structures, users get charged for the software they use instead of being tied to giving only certain users license to use the software applications on their desktops.

As these new policies aim to control licensing by measuring how often the package is used — based on inputs, time or on a per-user basis — electronic monitoring devices must also be employed to ensure license compliance.

However, companies are finding these flexible arrangements involve a new set of restrictions. For example, a company can find itself locked into a too restrictive licensing arrangement if it has a five-user license and suddenly needs six to complete a project.

Advantages

By plugging an LS API-compliant utility into their PC LAN, users will begin to gain some of the advantages of granular licensing that electronic licensing and the LS API promise. Different vendors' implementations of the LS API address this issue.

However, desktop application vendors must first supply built-in license hooks that will find and verify a valid license at the site. New metering tools that are in-

LS API, *page 48*

IBM, Stac sign data compression deal

By Ed Scannell

IBM and Microsoft Corp. resumed their battle in the data compression market earlier this month when both companies announced new alliances and products.

IBM has aligned itself with Microsoft archrival, Stac Electronics, Inc., signing a deal that lets it incorporate Stac's LZS compression technology in all of its software products, most notably PC DOS 6.x and OS/2 2.x series.

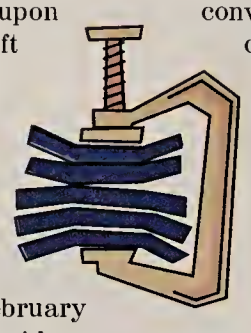
Just one day before that announcement, Microsoft Chairman Bill Gates announced at the Corporate Association for Microcomputer Professionals annual show that his company would resume shipping a compression product in MS-DOS 6.21 by mid-June. That unnamed product, which may or may not be entirely developed by Microsoft, is expected to enter beta testing shortly.

Interested parties

The users most likely to be interested in the compression packages are those with notebook computers or older desktop machines with disk capacities under 200M bytes.

Microsoft was forced to remove its DoubleSpace compression product, which had been bundled with its best-selling MS-DOS 6.2. A jury in the U.S. District Court in Los Angeles ordered Microsoft to pay $120 million in damages for infringing on two Stac data compression patents.

Microsoft began shipping on April 11 an MS-DOS 6.21 upgrade with the same features as MS-DOS 6.2 but minus the data compression utility. Users who purchase Version 6.21 receive a coupon for a free copy of the Microsoft compression utility.



With or without Stacker

While IBM is gearing up to ship PC DOS 6.3 by the end of this month [CW, Jan. 24], it is not expected to include a version of Stacker. Stac released in February Stacker 4.0, a product that provides a compression ratio of more than 2-to-1. IBM will likely slip the Stacker product into PC DOS 6.3 sometime during the first half of this year.

IBM has decided to bundle Stacker despite the court's having not yet ruled on an injunction sought by Microsoft that would prohibit further distribution of Stacker 4.0.

If the courts rule in favor of Microsoft, Stac and all those having licensed its technology — including IBM and Novell, Inc. — would have to suspend distribution of their products until they remove the offending code.

In addition, Compaq Computer Corp. has signed a deal to bundle Stacker with all its desktop and portable systems beginning later this year.

The latest version of Stacker allows both PC DOS and OS/2 users to quickly convert data residing under other compression formats to Stacker's compression format.

Despite Microsoft's claims that a little less than two-thirds of its DOS 6.0 and 6.2 users were using the product's built-in data compression capability, many corporate users believe compression is not as hot an issue for desktop systems as it was a year or two ago.

Large storage capacity

Corporate users said desktop systems from most hardware suppliers are shipped with increasingly large disk storage capacities that are more than ample to handle their data requirements. If they use it at all, it is mostly on portables.

"Most users concerned with compression these days are the lower-end users with 286- or 386-based systems or those users with portables. Most users with 300M-byte and 400M-byte drives use [compression] in a very limited fashion," said Bill Cornfield, president of the Windows Support Group, a New York-based software consultancy.

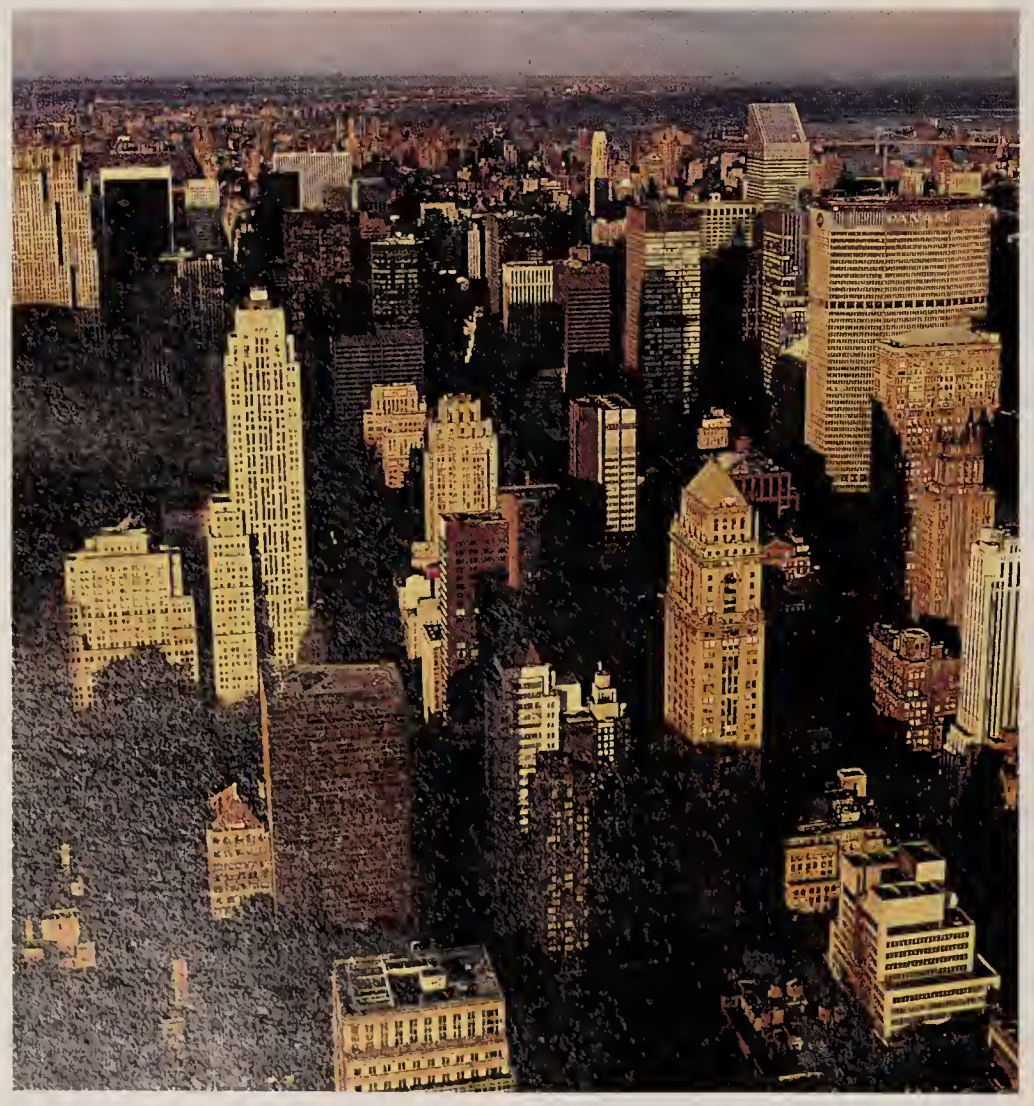
Separately, Stac officials announced the company is extending its Stacker 4.0 upgrade to users of MS-DOS 6.0 and 6.2, PC DOS 6.1 and Novell DOS 7.0. Users of the new Stacker 4.0 for Windows and DOS Universal Upgrade can upgrade for $49.95.

LS API

CONTINUED FROM PAGE 47

telligent enough to detect when an existing license is being stretched are needed to detect license strain and automatically adjust a user's license when needed.

New tools that will guide this process are expected out as soon as this summer. Lotus is planning to include the LS API in its desktop products, while Novell, Inc. is planning to offer a new licensed server that includes the LS API.



LOOKING FOR A BETTER WAY
TO TRACK YOUR CUSTOMER DATABASE?
165 NEW YORKERS CAN HELP.

Briefs

LCD commercialized

Kopin Corp. in Taunton, Mass., has commercialized a highly dense, active-matrix LCD originally developed by the MIT Lincoln Laboratory. Kopin's 640- by 480-pixel Smart Slide has a resolution of approximately 1,100 lines per inch. Its chip size is approximately one-half inch square. The small device is intended for head-mounted display applications such as virtual reality products.

Patent awarded

Advanced Logic Research, Inc., in Irvine, Calif., has been awarded a patent for a microprocessor upgrade technology it developed in 1989. The patent covers an upgrade process that disables the original microprocessor when another chip is installed in an upgrade socket. However, Advanced Logic may not be able to collect any royalties on the patent because the process it covers has been virtually eliminated since **Intel Corp.** introduced the Zero Insertion Force socket upgrade.

PC vendors back Intel

A slew of PC hardware and software vendors have announced their support for **Intel Corp.**'s emerging PC+MP multiprocessing platform specification. So far at least 11 major vendors, including **IBM**, **Novell, Inc.**, **Advanced Logic Research, Inc.** and **The Santa Cruz Operation**, will back the Intel specification. This means vendors will no longer have to tweak their multiprocessing operating systems quite as much to get them to run on Intel hardware.

Expanded licensing

Microsoft Corp. has expanded its Select volume licensing program to offer medium-size companies and organizations a plan more to their liking. The Open License Pak lets groups procure software in volume at three initial purchase points — 100, 500 or 1,000 units. Additional purchases can be made for 20 units or more.

In other news, Microsoft said last week it has shipped more than 1 million units of its Office applications suite since last November. It has also shipped more than 2 million copies of Word, including those in Office. By the end of its fiscal year on June 30, the company expects that about 60% of shipments of both Excel and Word will be through copies of the Office suite, said Robbie Bach, group product manager for Office.

Microsoft promotion

Microsoft Corp. has promoted Deborah Willingham to vice president of Product Support Services. Willingham, who joined the firm a little more than a year ago, was formerly general manager of support. She was previously director of IBM's Worldwide Manufacturing Technical Center.

Project management

Time Line aims at high end

By William Brandel

In an effort to reposition its product line as tools for enterprise users, Symantec Corp. has launched a project management tool aimed at a client/server audience.

Dubbed Time Line 6.0 for Windows, the tool can be stored in a SQL relational database. The product is compliant with Microsoft Corp.'s Open Database Connectivity (ODBC) standard, and its data can be integrated with applications such as Lotus Development Corp.'s 1-2-3 or Microsoft's Excel, according to Symantec. Time Line 6.0 can also be linked to other Windows applications via Object Linking and Embedding (OLE) 2.0.

Since the product is compatible with high-end SQL engines, it is expected to have broader appeal to an information systems audience, said Lee Davis, group product manager at Symantec, which is based in Cupertino, Calif. Formerly, Time Line was targeted at the PC LAN level, he said.

The new approach seems to be working. Sverdrup Corp., an engineering concern in St. Louis, is using the product to track its re-engineering project.

"It's nice to have the product that tightly integrated with SQL," said Bill Woloch, network administrator at Sverdrup. "We do not necessarily want to be tied to OLE 2.0. This tool gives us more options in systems that we can integrate into our project, like DOS."

Time Line 6.0 for Windows is priced at $699 and is available immediately. It requires a 386 PC or higher, 4M bytes of RAM, Windows 3.1 and 27M bytes of disk space.

An appeal to keep parity memory

IBM PC Co. president attempts to justify need for error checking

By Jaikumar Vijayan and Michael Fitzgerald
ROSEMONT, ILL.

IBM PC Co. President Robert Corrigan made a personal appeal to users to help him justify keeping parity-checking memory in IBM desktops.

Speaking at the Corporate Association of Microcomputer Professionals show, Corrigan told the crowd that IBM is wrestling with keeping parity memory as a standard in its PCs. This memory costs $30 to $50 more than regular memory, and according to Corrigan, "Your buyers say they don't want that stuff; they don't want to pay for anything extra."

He added, "I think you're setting yourselves up for problems" as PCs take on more and more mission-critical applications. "But I am the last fighter for this on my team . . . so I need some pushback. If you don't want [parity], I'll take it out."

Robert Corrigan, *IBM PC Co. president*

Better definition

Michael Shelley, a systems consultant at CNA Insurance Cos., which has between 10,000 and 12,000 Micro Channel Architecture PCs on LANs, stepped up to the microphone to tell Corrigan that his company needs a better explanation of parity's benefits before it can decide if it is necessary.

"If we're getting spurious bit errors that would cause us to pay claims incorrectly," then it is an issue, Shelley said. But IBM would have to demonstrate where parity errors cause problems in mission-critical applications.

Corrigan acknowledged that home users, or users with applications that are not targeted toward transaction processing, probably do not need memory parity. But for mission-critical applications, a lack of parity checking could cause a crucial system to hang as often as once a day.

Not necessary

Some users agreed that parity memory is important but said they do not want it on all of their PCs, particularly if it does not need to be there.

"Parity memory is more expensive," said Jerald S. Noble, director of telecommunications and PC support at the American Cancer Society in Austin, Texas. "I don't [think] they should cut it out; I think they should offer a choice there."

Corrigan said the PC Co. may begin to offer users a choice of what kind of memory comes with their PCs.

"Dumping that kind of memory out of the cost would be a good thing for IBM. You can't compete pricewise with that," said John Dunkle, president of WorkGroup Technologies, Inc. in Hampton, N.H.

Team drives

CONTINUED FROM PAGE 47

SmithKline Beecham in London, said, "They motored through on a very tight time schedule."

Heal declined to disclose numbers on efficiency but said employees in the purchasing department, for instance, showed significant gains in learning and retention over classroom sessions.

Of the advanced technologies group's efforts, Heal said, "This was a perfect example of their bringing in their expertise to the business."

"This was a perfect example of [advanced technologies] bringing in their expertise to thebusiness."

— Clive Heal, group purchasing executive, SmithKline Beecham

One year after the initial project was rolled out, multimedia training has moved into the mainstream at the company, and the advanced technologies group is no longer directly involved.

The job is basically to look at the near-term future. For example, "We want to figure out what comes after Lotus' Notes," said Dave Nesbit, director of advanced technologies at SmithKline Beecham.

Narrowing the focus

Currently, the main focuses of the advanced technologies group are object-oriented technology and creating a definition of client/server computing. Desktop videoconferencing is a specific subcategory that has generated interest at the company.

Alexander said the advanced technologies group has begun to focus on strategic issues more than on pure technology, in part due to occasional friction with the mainstream information systems departments.

"Because we bring new technologies to the table, we can sometimes be the bearer of bad news," said Joseph Awe, a manager in the advanced technologies group.

Awe said conflicts can develop if an information resources group is trying to stabilize a project and advanced technologies says it needs to add several pieces to the project to fit in with future standards.

User support

The strategic focus may lead to more consistent user support, something Heal said he would like to see. "If I have to comment on the [advanced technologies] group generally, it would be that when you're working with them, they're very enthusiastic and good. Then there are times when you're almost unaware that they are there."

Heal said he would like to have "continuous contact" with the advanced technologies group and perhaps a way to regularly access the technology research the group does, even if it is technology the group has decided not to recommend for implementation.

In addition, Heal said he would like to see the group focus more on business issues and less on technology.

Renamed Computerland sets new course

Newly named Vanstar, Inc. expands from reselling to outsourcing business

By Michael Fitzgerald

What's in a name? That which we call a rose by any other name would smell as sweet, but a renamed Computerland Corp. says it is sniffing out a business other than pure reselling.

The name change, from Computerland to Vanstar, Inc., follows the sale last year of Computerland's franchises to Merisel, Inc. The franchises will retain the Computerland name, while Vanstar will retain 50 sales offices that will function as the PC outsourcing organization, offering one-stop shopping for every aspect of the PC procurement and management cycle, and the traditional PC reselling.

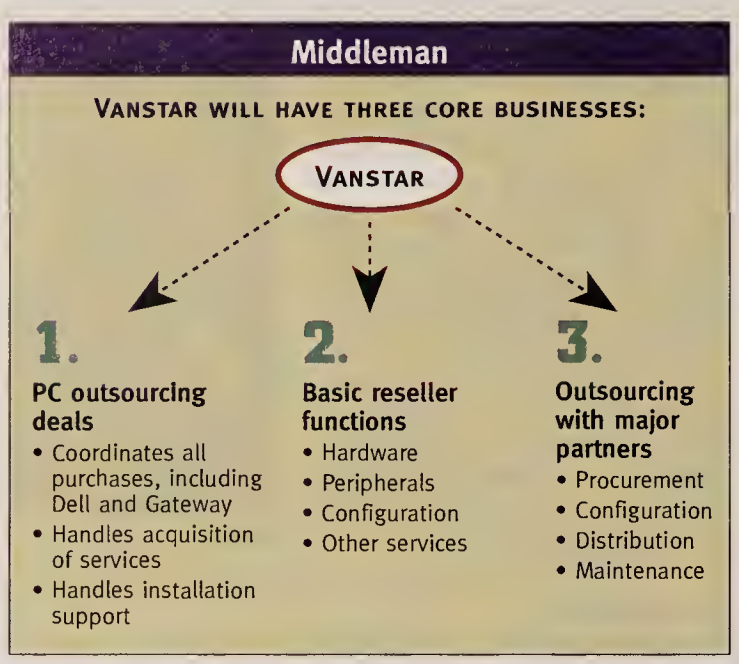
Internationally, Vanstar will continue to be known as Computerland.

Integrated provider

The name change also represents the culmination of a three-year effort by Chairman and Chief Executive Officer William Y. Tauscher to become an integrated services vendor. Under Tauscher, Computerland bought Nynex Business Centers and TRW Services, Inc. Tauscher said the entire operation is now integrated into one.

"Our proposition is that the dirty little secret of the PC market is the exploding cost of service and support," Tauscher said. "Somebody's going to need to solve that, and we believe it's our opportunity."

Tauscher argued that Vanstar can offer customers expertise in areas that are not central to the information systems function such as training, help desk and support, installation and integration and procurement.



Outsourcing

Vanstar's new emphasis is on the outsourcing market. Last month, the company announced it had signed a $100 million deal with Microsoft Corp. to handle the Redmond, Wash., software company's PC procurement and management. Vanstar will even manage Microsoft's purchase of machines from direct vendors Dell Computer Corp. and Gateway 2000, Inc.

"This is a focus issue — of course a Microsoft can do [this], but they can get savings by having their supplier do all the interface part [with PC makers], and put their bodies onto other tasks," Tauscher said.

Analysts said Vanstar will face a stiff battle to prove it is a legitimate player in the market.

"It's a financial imperative — his transaction costs and process costs require big quantities of products," said Bruce Stuart, president of Channel Corp. in Vancouver, British Columbia. Stuart added that Vanstar's costs were higher than those of typical resellers.

The right stuff

Stuart said Tauscher has made the right investments in his internal infrastructure. But the consultant noted that Tauscher is "pushing into quite a different set of competitors. When you start talking to end users about a feasible set of outsourcing organizations, you get a whole bunch of organizations that Tauscher hasn't competed with."

Vanstar hopes that a deal with Integrated Systems Solutions Corp. (ISSC), IBM's outsourcing arm, will help give it credibility. Vanstar expects to generate at least $100 million in revenue from the ISSC deal, under which ISSC gives Vanstar responsibility for handling several aspects of its PC business, including procurement, upgrades and maintenance.

Briefs

CD-ROM patent revoked

A controversial patent awarded last summer to **Compton New Media**, a Tribune Co. unit, was overturned by the U.S. Patent and Trademark Office earlier this month. The patent, which covered a common technique for recording multimedia to CD-ROM, was jointly held by Compton and Encyclopaedia Britannica, which sold Compton to Tribune Co. last September. The patent office, which decided to reexamine its award in December, rejected each of the 41 claims granted in the patent, a Tribune spokesman confirmed. Tribune has 60 days to appeal the decision or file a narrower patent, he added. The original patent award last August prompted howls of protest from software developers, who faced having to license the recording technique from Compton.

Sears to sell AT&T PCs

Sears, Roebuek and Co. has agreed to become the first national retailer to sell **AT&T Global Information Solutions** computers, including the AT&T 3155, a 486SX-based, 33-MHz multimedia computer priced at $1,599.

Dauphin adds wireless data

Dauphin Technology, Inc., a maker of mobile computers in Lombard, Ill., added a wireless data unit to its most recent product family last week. The DTR-1/WAN uses a RAM Mobile Data radio and an extended battery pack. The module, which slips onto Dauphin's DTR-1 486-based mobile computer, will be available in the second quarter. Pricing has not been determined. In mid-Feburary, Dauphin introduced a similar wireless LAN module for DTR-1.

Gray market sales barred

Mierosoft Corp. won a ruling in U.S. District Court barring gray market sales of the company's systems software by hardware OEMs. The court found that Harmony Computers & Electronics, Inc. in New York violated the terms of OEM distribution agreements by selling copies of DOS and Windows as stand-alone products rather than with PCs.

Merger moves

Broderbund Software, Inc. promoted William M. McDonagh to president and chief operating officer following the retirement of Ed Auer. After completion of the merger of Broderbund and Electronic Arts, McDonagh will report to Larry Probst, president and CEO of Electronic Arts.

Software help lines

Corporate Software, Inc. in Canton, Mass., will introduce 1-800 and 1-900 telephone numbers to provide on-line assistance and service to users of DOS 3.3 and Lotus Development Corp.'s Notes.

Commentary

Carole Patton

Locked? Shred? File undead!

Groupware is "In." Every networked corporate user these days has at least one electronic-mail address. And shipping strategic (even sensitive) files around the company has become the norm. But, in the midst of all this sharing, what about the issues of privacy, security and industrial espionage? If you talk to networked users, you'll discover a common worry: Just who is reading my E-mail?

It's true that most of us are not spies, and our electronic correspondence is not the heady stuff of headline news. We may never see the *60 Minutes* camera crew at our doors. But odds are your "private" messages are readily available to prying eyes with a much lower profile. This is because no matter what internal mail system you use, the messages you delete probably aren't gone at all. Rather, they've been moved into a file where they will remain until your PC is shut down for the day.

Back from the dead

What about files that you've deleted? If your software has an undelete feature, they can be easily resurrected. In fact, you can even rescue objects from the shredder (OS/2's equivalent of a Macintosh trash can) even after you have confirmed their deletion. That is because the OS/2 Config.Sys file includes a special statement: REM DELDIR. If invoked (by removing the REM, which instructs your PC to ignore the command), DELDIR will recover all your deleted files and save them in a special directory.

This means that anyone with access to your computer can open your Config.Sys file, get rid of the REM in front of DELDIR and periodically collect every file you send to your shredder. All anyone need do is type "DELDIR" from the OS/2 prompt. In fact, once DELDIR is active, just typing "DELDIR/L" from a DOS or OS/2 command prompt will instantly produce a list of all your deleted files.

Screen savers, often used to obtain a moment's privacy, can be easily breached. Even commercial screen savers such as those for the Windows operating environment, which require a password before restoring the screen, give many users a false sense of security. Anyone can get into these password-protected files by turning off your PC and rebooting. In fact, they can open your Control.Ini file in Windows and change your password just by rearranging the order of the characters in the PASSWORD= statement found there.

If you're an OS/2 user you can set a password to lock your system on start-up. However, somebody who doesn't know your password, including yourself if you forget it, can circumvent this lock by booting OS/2 from an installation disk or a floppy. They can go to the OS/2 prompt and type "MAKEINI 0S2.INI-LOCK.RC." This restores your desktop to the way it was before you locked it.

If the issue is privacy, as opposed to security, perhaps a screen saver is all you need. Sometimes the most danger comes not from espionage but from children who have little reverence for the work done on a home PC. A disk-locking system like the one for Windows just released by Symantec in Cupertino, Calif., called Disklock 3.0, will effectively seal out these little fingers. (The kids can still access their own directory of games.) Disklock is a device driver that loads before your system software when you turn on your computer. Without a valid password, nobody can boot your system, even by using a floppy disk.

There is a trade-off between making it easy for everybody to share information and the need for data protection. What's important is being PC-literate enough to protect what really is important.

In my last column, I challenged vendors for putting hidden files in their software. Most readers agreed that this was not a good practice. But I did receive a few irate responses like this one from reader Rich Ives: "The notion that no file should be hidden or hard to delete is unacceptable given the state of user education. Do you really believe that the hidden system files in DOS should be visible so some naive user can delete them?"

My answer? Yes, everything should be visible, and vendors should do a better job of educating those "naive" users. Hiding files that are important is not an acceptable alternative to good documentation. The file "EA DATA.SF," which Mr. Ives and I both agree is so critical, is not explained anywhere in the OS/2 user manual. Perhaps it is so secret that even IBM doesn't know about it.

Patton is chief analyst at Mendham Technology Group in Mendham, N.J. She is also the author of *OS/2 Secrets* and co-author of *Windows Configuration Secrets*, coming soon from IDG Books. Contact her at MCI 401-4869 or CompuServe 73700,2503.

HELP LINE

Part of an occasional series of user tips provided by Corporate Software, Inc. in Canton, Mass.

Lotus Development Corp.'s 1-2-3 for Windows Release 4.0

Q: How can I convert the formulas in my spreadsheet to values?

A: There are two ways to convert formulas to values in Release 4.0. As with previous releases of 1-2-3, you can convert them using Range/Value, or you can use the following procedure: 1) Select the range you want to convert to values; 2) Select Edit/Copy; 3) Select Edit/Paste Special; 4) In the pop-up window, select Formulas As Values and click on OK.

Q: When I print my spreadsheet using the Current Worksheet option, I lose all my formatting. Why?

A: If you use the Current Worksheet option when printing or previewing a spreadsheet, only cells containing data will appear. To print or preview an area that contains formatting (such as borders or shading) but no text, use the Selected Range option.

Q: When I retrieve a spreadsheet created in 1-2-3 for DOS, how do I open the associated graphs?

A: When you retrieve spreadsheets created in any DOS release of 1-2-3, you must open associated graphs as follows. First, open the worksheet. Then choose Go To from the Edit menu. Change the Type for File option to Chart, and then double-click on the targeted graph name. This will insert the chart directly into the worksheet.

Lotus' Ami Pro Version 3.0

Q: When I use certain style sheets, I am prompted for personal information. Is there any way to change the default information in this dialog box?

A: The information can be changed by running the Collect macro. Select Tools/Macro/Playback and select COLLECT.SMM.

Q: Sometimes when I work with formulas in a table, the word "REF" appears. What does this mean, and how can I get rid of it?

A: The word "REF" appears when an invalid character is used in a table cell that is included in a formula. For example, a letter or a space would be an invalid character in a cell that is included in a formula that adds a series of numbers. When you delete the invalid character, the formula will calculate correctly and the word "REF" will disappear.

Q: Whenever I try to open a file when another file is already open, the first one always closes. How can I keep that document open and open another at the same time?

A: To have more than one file open at a given time, select Open from the File menu, and then deselect the option Close Current File.

Lotus' Notes Version 3.0

Q: Sometimes after I have composed a document in my Notes database, I am unable to go in later and edit it. Shouldn't I be able to edit a document that I have composed?

A: When designing Notes forms, be sure to include an Author Names data type field. If the form contains only a Names field, documents composed with that form cannot be edited by their authors.

New Products

Texas Instruments, Inc. has announced Omni 800 Model 830E and 835E forms printers.

According to the Dallas company, both models offer four printing speeds: 360 char./sec. in Super-Speed Draft mode, 300 char./sec. in High-Speed Draft mode, 250 char./sec. in Utility mode and 63 char./sec. in Near-Letter Quality mode.

The Model 830E is a narrow-carriage, 80-column printer, and the Model 835E is a wide-carriage, 136-column printer.

Both printers employ a 9-pin printhead and a 23K-byte print buffer and are capable of printing five-part forms.

Model 830E costs $579, and Model 835E is available for $829.

▶ *Texas Instruments*
(214) 995-2011

MicroNet Technology, Inc. has announced support for Apple Computer, Inc.'s PowerPC Macintosh products with updated versions of its SCSI Utilities 6.2.1 and hardware enhancements.

According to the Irvine, Calif., company, the utilities provide PowerPC users with across-the-board compatibility with hard disk drives, removable cartridge drives, optical drives, CD-ROMs and tape devices.

The MicroNet PowerPC-compatible products include internal hard drives (540M to 2.05G bytes) priced from $1,475 to $3,495, external hard drives (1.01G to 2.78G bytes) from $1,535 to $3,995, rewritable optical drives (128M to 1.3G bytes) from $1,030 to $3,995 and digital audio tape backup systems (2G to 8G bytes) from $1,369 to $2,295.

▶ *MicroNet Technology*
(714) 453-6000

RasterOps Corp. has introduced ClearVueColor, a line of multiplatform, high-resolution color displays that include the ClearVueColor 17 and the ClearVueColor 20T monitors.

According to the Santa Clara, Calif., company, both ClearVueColor monitors are fully compatible with all CPU offerings from Apple Computer, Inc., including the Power Macintosh and all PC-compatible x86-based computers.

Features for ClearVueColor 17 include universal power supply, an invar shadow mask tube, 0.26mm dot pitch and programmable microprocessor-based memory.

The ClearVueColor 20T offers 0.31mm stripe pitch, multiple-scan technology, an ergonomic design and dual-color temperature selection.

The ClearVueColor 17 costs $1,049, and the ClearVueColor 20T is priced at $2,149.

▶ *RasterOps*
(408) 562-4200

FieldWorks, Inc. has announced the FW7500, a Field WorkStation.

According to the Eden Prairie, Minn., company, the product employs the IBM 75-MHz 486 Blue Lightning processor and houses a proprietary card-cage technology. This enables the user to plug in six half-size, three full-size or a combination of IBM XT/AT bus-compatible expansion cards in a package that is 3¾ inches and weighs 12½ pounds.

Other features include up to 64M bytes of RAM on board, a Type I-IV PCMCIA expansion slot, an on-board CD-ROM drive option and dual-scan VGA color display.

The FW7500 costs $7,995.

▶ *FieldWorks*
(612) 947-0856

FieldWorks' Field WorkStation *enables users to plug in multiple expansion cards*

Com&Dia, L.L.C. has introduced Dialock Boot, a PC-based user productivity package.

According to the Raleigh, N.C., company, Dialock Boot increases user productivity through a variety of means, including virus prevention, piracy prevention, a single sign-on feature that eliminates multiple sign-ons and passwords and simpler management.

The product requires an IBM XT, PS/2, AT or compatible computer with 640K bytes of memory, a hard drive and DOS 3.3 or higher.

Prices start at $199.

▶ *Com&Dia*
(919) 878-6503

Landmark Systems Corp. has introduced Top/X, a PC-based tactical automation tool for the enterprise.

According to the Vienna, Va., company, Top/X resides on a PC and provides users with the ability to automate and monitor critical system events for a variety of computing environments.

Users can monitor and respond to events on Unix, MVS, VSE, VM, OS/400 and VMS platforms and dial in from a remote PC to receive access to system consoles for problem determination and resolution.

A base license for Top/X costs $10,000.

▶ *Landmark Systems*
(703) 902-8000

PC Guardian has announced Encryption Plus, encryption software.

According to the San Rafael, Calif., company, Encryption Plus was designed to encrypt data on any local drive and provide secure transmission of encrypted data through a modem or disk.

Users do not need to remember an encryption key; instead they enter a password each time they boot their PC.

The encryption/decryption is automatic and transparent.

Encryption Plus costs $49.95.

▶ *PC Guardian*
(415) 459-0190

Symantec Corp. has announced that the Symantec AntiVirus for Macintosh (SAM) Version 3.5 has update capability to recognize and protect against the INIT 29-B virus.

According to the Cupertino, Calif., company, SAM Version 3.5 users can update the detection and repair capabilities of the program against the virus by entering the user definition into SAM Virus Clinic.

After entering the SAM user definition, users can scan for INIT 29-B from both SAM Virus Clinic and SAM Intercept.

SAM Version 3.5 costs $99.

▶ *Symantec*
(408) 253-9600

Patton & Patton Software Corp. has introduced Flow Charting 4 for Windows, a flowcharting program.

According to the Morgan Hill, Calif., company, the product provides three primary modes of operation: shapes, lines and text, which are changed through task-specific button bars.

Flow Charting 4 offers "Snapshot," a memorization feature that records object (shape, line and text) attributes and lets the user transfer those traits to new ones.

A single-user version of Flow Charting 4 costs $315.

▶ *Patton & Patton Software*
(408) 778-6557

Palisade Corp. has announced @Risk Analysis and Modeling Software.

According to the Newfield, N.Y., company, @Risk 3.0 works in Windows with versions that support PC Excel and 1-2-3 for Windows.

The product provides a Sensitivity Analysis feature that lets users see which of their worksheet variables are the most important.

Scenario Analysis identifies combinations of input variables that are important in triggering a given output to achieve user-specified targets.

A single copy of @Risk costs $395.

▶ *Palisade*
(607) 277-8000

Kidasa Software, Inc. has announced Version 4.0 of Milestones, Etc., project management software.

According to the Austin, Texas, company, the product was designed for users who want to put visibility into their projects.

Features include support for Object Linking and Embedding 2.0, multiple document interface support, drag and drop, custom import and basic drawing tools.

Milestones, Etc. 4.0 costs $149.95.

▶ *Kidasa*
(512) 328-0167

WexTech Systems, Inc. has introduced enhancements for Doc-To-Help, its hypertext publishing system for Microsoft Corp.'s Word for Windows.

According to the New York company, the program enables Word for Windows users to create commercial-quality documents and Windows on-line help from a single source.

Doc-To-Help offers Hyperformance Tools that include the Doc-To-Help Navigator, 256-color bit-map support, watermarks, The Help System Setup Wizard, a remapping utility and context-sensitive help creation.

Doc-To-Help costs $295.

▶ *WexTech Systems*
(212) 949-9595

Individual Software, Inc. has announced Professor Windows, a computer-based training program that covers the features of the Windows 3.11 operating system.

According to the Pleasanton, Calif., company, the product includes a copy of The Windows Insider, a guide that offers shortcuts and tips to optimize working in Windows.

Professor Windows costs $39.95.

▶ *Individual Software*
(510) 734-6767

Product shorts

ImageFast Software Systems, Inc. has announced ImageFast 2.0, document and image management software. ImageFast 2.0 includes action icons and a database design wizard that lets users specify the data elements required for indexing images and objects it has stored. RedactFast is a feature that electronically "blacks out" sensitive information. Cost: $195. ImageFast Software Systems, McLean, Va. (703) 893-1934. . . . **Logitech, Inc.** has introduced the MovieMan Video & Audio Capture Board. The product captures CD-quality audio and true-color video together at a full 30 frame/sec., eliminating the need for a separate sound card. Cost: $299. Logitech, Fremont, Calif. (510) 795-8500. . . . **SoftLogic Solutions, Inc.** has introduced Help Yourself, a fully integrated authoring tool for developing Windows help files for programs and on-line information systems based in Windows help. A help compiler, WYSIWYG editor, spell checker, thesaurus and project manager are included. Cost: $99 until June 30. SoftLogic Solutions, Manchester, N.H. (603) 627-9900. . . . **DeltaPoint, Inc.** has announced that DeltaGraph Pro 3, its charting and graphing program, supports Power Macintosh computers optimized for Apple Computer, Inc.'s RISC-based Macintosh computers. DeltaGraph Pro 3 features 60 business, scientific and technical charts and graphs, including histograms, pictographs and scatter plots. Cost: $195. DeltaPoint, Monterey, Calif. (408) 648-4000. . . . **Shapeware Corp.** has introduced Visio Express for Microsoft Corp.'s Office, a drag-and-drop drawing program designed for users of Microsoft's Word, Excel and PowerPoint. The product offers improved integration with Microsoft's Object Linking and Embedding, block diagrams, organizational charts and timelines. Cost: $79. Shapeware, Seattle, Wash. (206) 521-4500.

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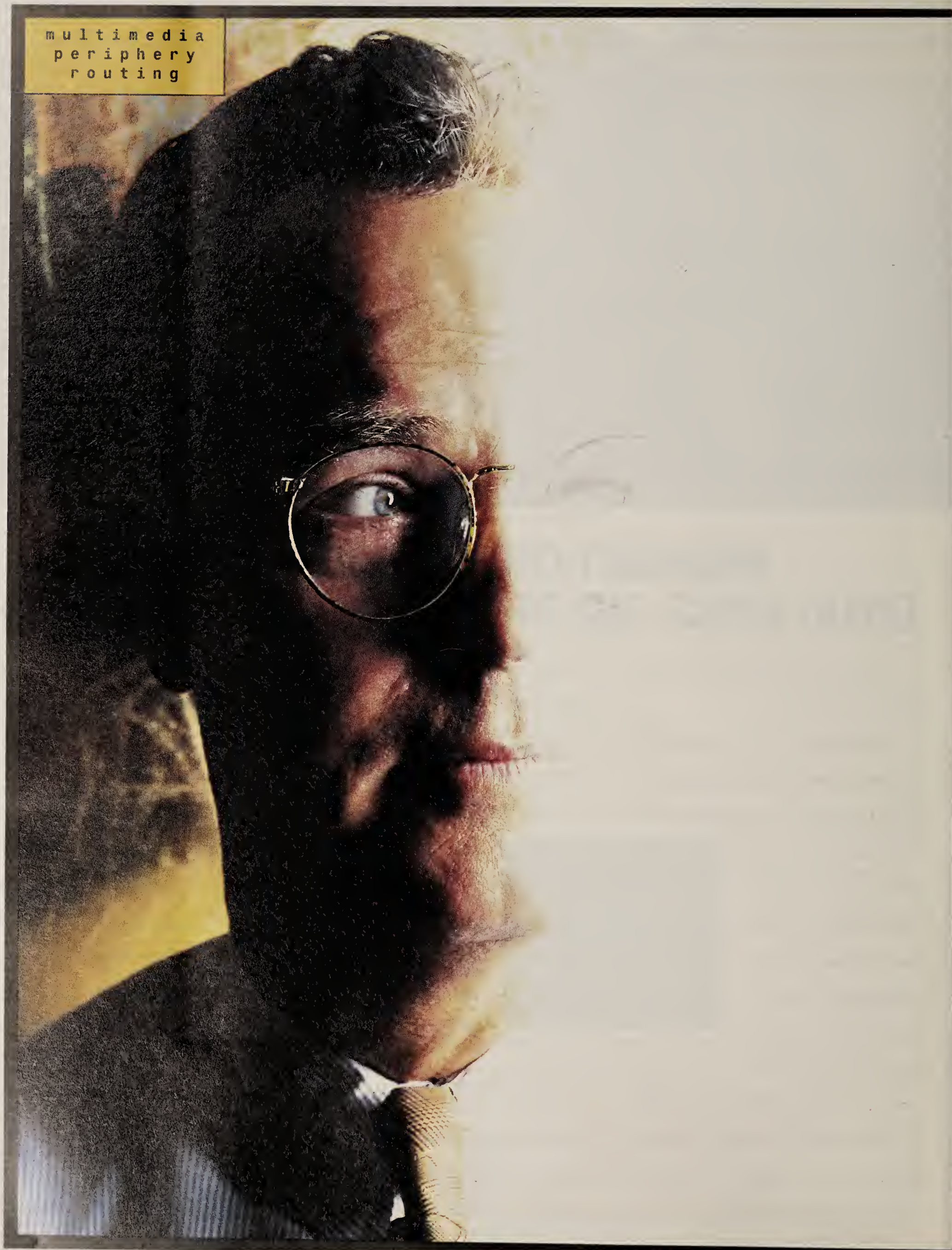

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When Moving From SNA to LANs...

The Fail-Safe Route Is Clear!

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THE REAL TRUTH OF MERGING SNA AND LANS

The computing landscape is changing rapidly. The path to a reliable, cost-effective information system to support your company's mission-critical applications was once clearly marked. No one ever got fired for buying IBM, and SNA networks dominated the computing front.

The current computing topography is rougher. The architecture has shifted from SNA-based mainframes with thousands of far-flung terminals to PCs and LANs. Corporate management and MIS must choose among many different options for their information systems. Not all choices are safe, and confusion abounds. Make the wrong choice, and you're in for a painful and career-limiting recovery.

PCs and LANs engendered the end-user revolution. Using PCs, Macintoshes, and UNIX workstations, workers can choose their own applications and generate their own information, while connecting to corporate databases and mainframes, and communicating with remote and local co-workers. Client-server networks enable workers, from top management to shipping clerks, to glean information more quickly. They enable management to reduce bureaucracy, invest in scalable computing power, and ultimately, reduce hardware and software costs. But client-server networking calls for more complex networks, especially where legacy SNA networks and the new LAN-based networks must peacefully coexist to share the same costly WAN lines.

TWO DIFFERENT WORLDS

Your company can benefit substantially by integrating SNA and LAN networks. You can reduce the cost of WAN lines, devices, and support staff; you can deploy client-server applications and deliver a new level of service. Nevertheless, you must be prepared to face technical challenges that require know-how and carefully chosen products. Most LANs are built with multiprotocol routers, as they are becoming the accepted way to carry SNA traffic over LAN networks. But not just any router will work. Here's why.

Data Traffic. SNA networks are structured hierarchically, with the mainframe as the anchor. They are characterized by order. The users' terminals are connected to communication controllers, which are permanently attached to the mainframe's front-end processors (FEPs). The FEPs control the data traffic flow from the terminals to the mainframe.

LANs don't have a communications hierarchy; any PC can communicate with any other PC or server anywhere on the LAN. Traffic is characterized by periods of extreme congestion, then total silence. Predicting the network capacity needed to sustain both SNA and LAN traffic is nearly impossible.

Link Availability. Remote SNA devices are typically connected to FEPs via dedicated leased lines so the devices don't compete for bandwidth. Connecting remote LAN sites via WAN links is much more difficult because LAN traffic is random. If an SNA session needs to communicate over the same WAN line, link availability will be uncertain and response times uneven. The result: if the LAN transmission grabs the link first, an SNA user's session can get trapped behind a large file transfer between two LAN devices or the SNA user's session may time out. Adding more WAN bandwidth is too costly to be practical. Should a WAN link fail, routers will reroute traffic over an alternate path, if one exists. Unfortunately, LAN routing protocols make their rerouting decisions so slowly that SNA sessions will be lost when rerouting occurs because of WAN congestion or failure.

Routing. Conventional routers don't handle SNA data as adeptly as LAN traffic. Protocols, such as Novell IPX, TCP/IP, DECnet and AppleTalk, were designed to withstand a LAN's aperiodic nature. These protocols use special Network-Layer addressing, which helps routers make communication order out of the LAN chaos. The SNA protocols don't have Network-Layer addressing, so standard LAN routing technology cannot route SNA. Special techniques must be used.

NetBIOS Broadcasts. NetBIOS broadcasts can erode bandwidth. Like SNA, NetBIOS lacks a Network Layer. Worse, some NetBIOS applications use logical computer names, instead of MAC-Layer addresses, to identify source and destination computers. These packets can be mistaken for broadcasts, since both packet types have empty source and destination address fields. Consequently, NetBIOS packets can traverse all subnets, causing a NetBIOS broadcast storm and wasting bandwidth.

Network Maintenance. MIS personnel accustomed to supporting SNA networks are surprised how much more involved LAN support is. Supporting mission critical business applications on such a network is an even greater challenge. ■

THE SIX CHALLENGES OF MERGING SNA AND LANS

FAIL-SAFE NETWORKING: Build a network that keeps running even if one part fails. Your business depends on it.

RESPONSE TIME: LAN traffic interferes with mission-critical SNA applications, causing unpredictable response times for users. Resolve congestion issues and prioritize SNA data.

SESSION TIME-OUT: A link or router failure can crash SNA sessions. Build redundant networks.

NETBIOS BROADCASTS: Broadcasts waste WAN resources. Restrict NetBIOS broadcasts.

NETWORK MAINTENANCE: With the complexity of LAN-based networks maintaining them is difficult. Keep the network easy to install and understand.

MULTIPROTOCOL ROUTERS: Not all routers can route LAN and SNA traffic efficiently. Choose a router carefully.

SNA AND TCP/IP DEAL IN DIFFERENT WORLDS

NATIVE SNA
(70% of corporate business)

- Has very high reliability requirements; lost sessions mean lost data and lost business.
- Response times are consistent.
- Sessions can be prioritized; class-of-service options are included.
- Native protocols run at low overhead.

TCP/IP AND ROUTERS

- Reliability requirement less stringent; sessions can be re-established quickly.
- Response times vary depending on traffic flow.
- Prioritization and class-of-service are included only in latest implementations, but not for SNA.
- IP encapsulation techniques add overhead and slow performance.

HOW TO MERGE SNA AND LANS

Combining SNA and LANs cement two formerly separate spheres, requiring an understanding of the issues from both the SNA and LAN viewpoints. Recently, some people have been quick to label integrating SNA and LANs as unworkable, without fully comprehending the issues. But take some time to delve into the issues, and you'll find that cost savings, increased reliability, and ultimately, a competitive advantage for your company lies down the path.

The easiest part of integration is building the enterprise network using LANs. Enterprise networks are built with multiprotocol routers interconnected by WAN services, ranging from dial-up lines to T-1 and ISDN. Routers can very effectively connect networks running TCP/IP, Novell IPX, DECnet, and AppleTalk. But that's not the entire laundry list of protocols. SNA and NetBIOS are two protocols that are not easily routed.

PUTTING SNA ON THE LAN

Maintaining SNA and LAN networks separately requires two sets of WAN lines, WAN devices, and staff. Clearly, this is very costly. The first step to combining the SNA and LAN networks is getting the SNA traffic to a router, so it can be delivered to its destination. SNA packets can arrive at a router in three ways: already be on the LAN, SDLC Pass-Through, or SDLC-to-LLC conversion (see figure at right).

On the LAN Already. LAN-attached PCs and workstations running SNA applications communicate with the mainframe via NetBIOS or 802.2 Logical Link Control (LLC). These packets arrive at the router's LAN port. The routers transmit these packets over the LAN and eventually to their destination device.

SDLC Pass-Through. A remote 3174 controller can be connected directly to a router's SDLC port. Such a router accepts the SDLC packets, converts them to LAN look-alike packets, and sends them across the network. At the receiving end, a router re-converts the LAN packets to SDLC, and delivers them to the destination FEP via its SDLC port. FEP polling packets are also delivered to the 3174 controller this way. Routers simply add and remove a few data bytes to make the SDLC packet into a LAN look-alike packet; they don't interpret what's in the SNA packet.

SDLC Pass-Through is the simplest and safest way to connect routers to SNA devices, since it eliminates the interaction between routers and the SNA equipment. Any incompatibilities or deviations from the norm, for which SNA equipment is infamous, are avoided. A minor drawback of SDLC Pass-Through is that the polling FEP packets must traverse the network, adding to the load on the WAN. Another disadvantage is that an expensive SDLC port on a FEP must be used.

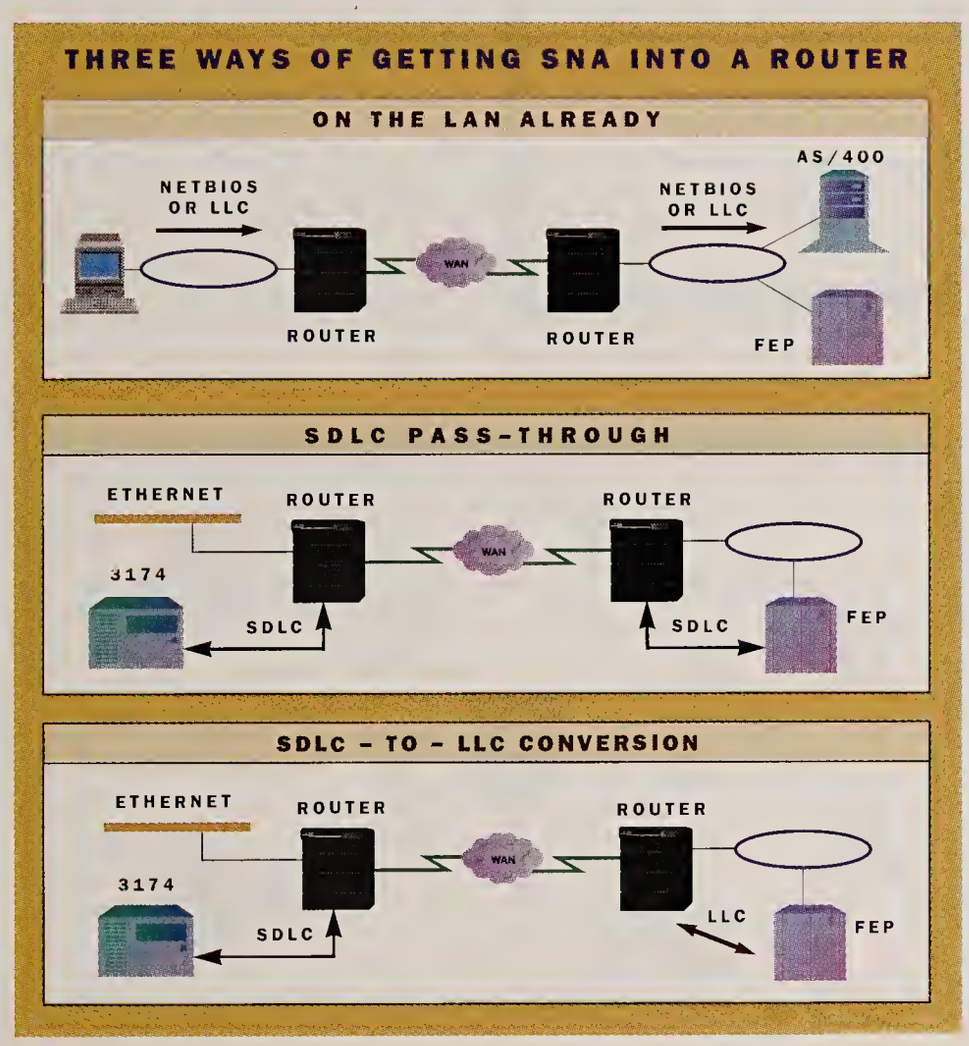
SDLC-to-LLC Conversion. A router can convert SDLC-to-LLC, which means that an SDLC packet from a 3174 controller is translated into a true LAN packet that's the same as one from a Token Ring-attached 3174 or a LAN-attached PC. At the other end, the destination router uses its LAN port to transmit the packet onto a LAN, thereby delivering it to the FEP. The SDLC-to-LLC conversion also eliminates the FEP polling packets, so they don't traverse the network.

ROUTING SNA AND NETBIOS

Getting the SNA to the router is half the battle. The other half is getting the SNA packet across the corporate network to its destination. Choose your delivery methods carefully. Here's where SNA and LAN traffic must share the same line, and LAN congestion may cause SNA sessions to drop.

As the figures show, SNA can travel the network in three ways: TCP/IP encapsulation, data-link switching (DLSw) and Protocol Independent Routing (PIR).

TCP/IP Encapsulation. TCP/IP encapsulation wraps an SDLC, NetBIOS, or LLC



THE SEVEN STEPS TO COMBINING SNA AND LANS

1. Route the routable protocols, such as NetWare, TCP/IP or DECnet, in their native mode in most large networks.
2. Connect 3174s to routers using either the SDLC Pass-Through or SDLC-to-LLC conversion method to save cost of TICs or external protocol converters.
3. Prioritize SNA to avoid response time problems caused by heavy LAN traffic.
4. Route SNA using PIR to deliver solid performance in terms of response time, reroute around congestions and failures, and maintain SNA sessions.
5. Enable NetBIOS broadcast resolution to gain 10 percent to 30 percent bandwidth improvement.
6. Use data compression, since it is the least expensive way to increase WAN capacity by a factor of two to four.
7. Build fail-safe networks to deliver high availability for the SNA and LAN traffic.

packet inside a TCP/IP packet, so TCP/IP routers can handle it. Any TCP/IP router that receives the packet treats it as an ordinary TCP/IP packet. At the receiving end, the router removes the TCP/IP encapsulation and delivers the packet to its destination via the LAN port (if it's a NetBIOS or LLC packet) or via an SDLC port (if it's an SDLC packet).

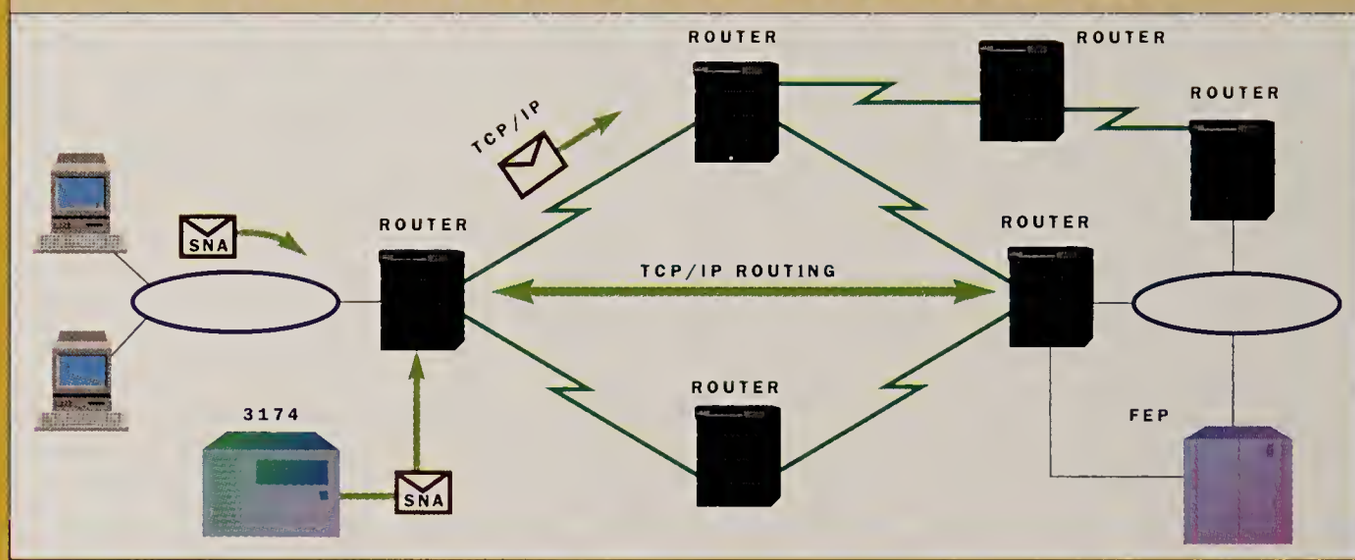
TCP/IP encapsulation received a lot of press before MIS shops installed it and discovered it doesn't work as well as expected. The problems are myriad. First, TCP/IP routing protocols don't reroute around congestions quickly enough, and some protocols, such as RIP, don't reroute at all. Consequently, SNA sessions are frequently terminated when a LAN device starts a large file transfer. Second, a WAN link or router failure almost certainly causes an SNA session time-out. Third, TCP/IP encapsulation adds a large overhead to every SNA packet, thereby reducing the WAN link efficiency and requiring costly, higher speed lines. Fourth, it doesn't protect the SNA packets from being crowded by LAN packets, since the routers don't distinguish between the time-sensitive SNA packets and ordinary LAN packets. SNA users experience random application response times. Finally, your company must invest in TCP/IP expertise to install, configure, and administer TCP/IP routers — a task no smaller than genning an NCP and one most SNA shops aren't ready for.

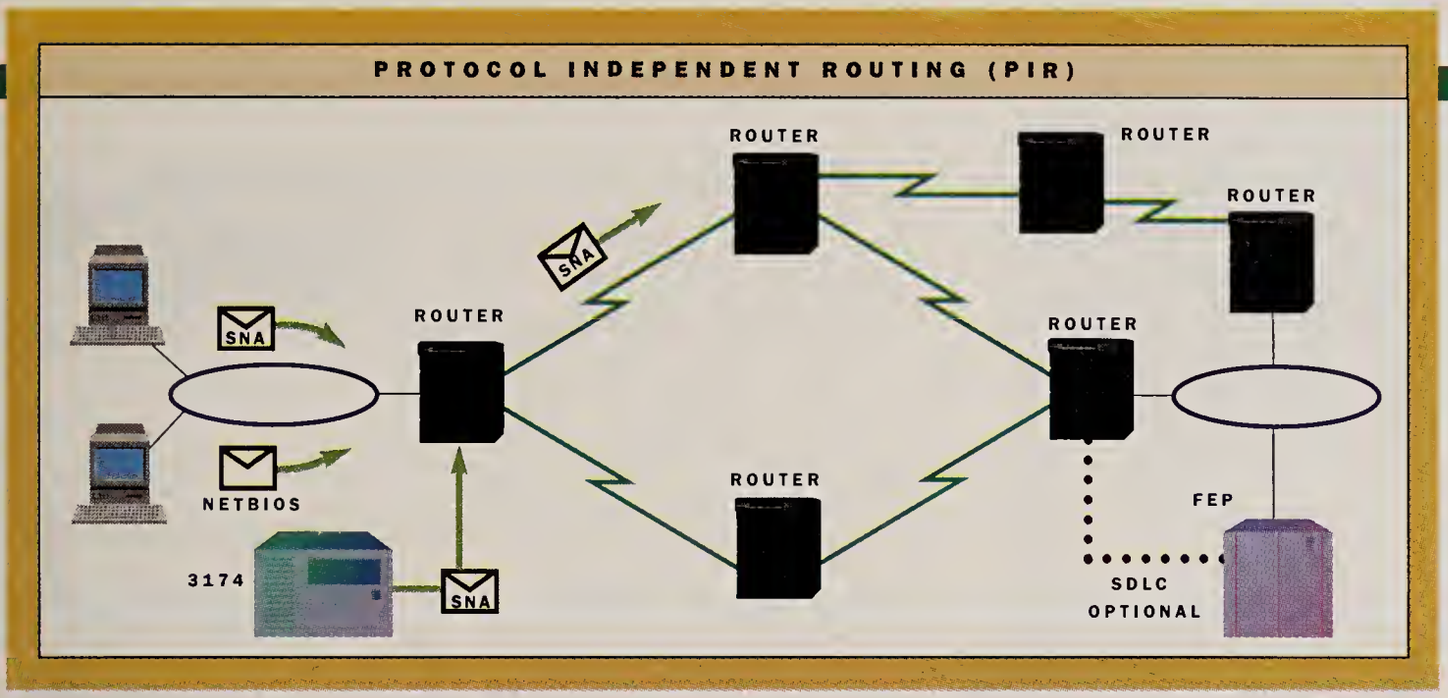
If you implement TCP/IP encapsulation, SNA sessions will be dropped, response time will be slow, and upkeep will be expensive. SNA routing can be done; it's just that TCP/IP encapsulation isn't the best option for the job.

Data-Link Switching (DLSw). IBM developed DLSw, a more sophisticated version of TCP/IP encapsulation, to solve some of encapsulation's serious deficiencies. Instead of encapsulating SNA inside a TCP/IP packet, DLSw converts SNA into TCP/IP (see figure below). The router that's directly connected to a 3174 controller creates a true TCP/IP packet from the SNA SDLC packet it receives. The TCP/IP routers at each end of the network implement a full Session-Layer communication as would two UNIX workstations, except the data is SNA. When a router receives an SNA packet from a 3174, the Session Layer assumes full responsibility for delivering it. Should the packet be dropped because of an error or WAN congestion, the routers will retransmit the lost packet without involving the SNA devices.

DLSw is intended to address the problem of SNA session time-out caused by WAN congestion and by certain WAN failures because it "holds" the session while the DLSw packets

TCP/IP ENCAPSULATION AND DATA-LINK SWITCHING (DLSw)





are being rerouted. However, since TCP/IP rerouting can take more than 30 seconds, users' screens will be suspended during that time. Ironically, most people would terminate their sessions by then, assuming that something went wrong.

SNA sessions will time-out if the destination router that is receiving the TCP/IP packet with SNA in it fails or is rebooted. DLSw creates as much, if not more, overhead as TCP/IP encapsulation and causes unpredictable response times, because TCP/IP packets can be crowded out by other LAN traffic. Unfortunately, TCP/IP expertise is again necessary for installing, maintaining, and administering the routers using DLSw. DLSw is appropriate only where SNA traffic is minimal and performance is not critical.

Protocol Independent Routing (PIR). PIR is a routing technique specifically designed to deal with all the issues of carrying SNA across multiprotocol corporate networks. PIR creates Network-Layer addressing for SNA. As a result, PIR routes SNA packets in their native form, thereby eliminating the overhead of encapsulation.

SDLC packets received by a PIR router from a 3174 or similar controller are either passed through using the SDLC Pass-Through method or converted to LAN packets using SDLC-to-LLC conversion.

PIR, on average, reroutes around network congestions and failures in three seconds, ensuring that SNA sessions stay up. Giving SNA packets transmission priority over LAN packets guarantees that SNA traffic is always sent ahead of any LAN traffic. The combination of fast rerouting and prioritization means that user response time is consistent, no matter how busy the network is.

PIR's ability to reroute around congestions and failures without dropping SNA sessions applies to router failures as well. Unlike DLSw, which can lose SNA sessions if the destination router fails or is rebooted, PIR can use multiple destination routers. If one router fails, PIR simply finds another path and another router to deliver the SNA packets.

By routing SNA in its native form, PIR eliminates the complexity of installing, maintaining, and administering the complex TCP/IP and DLSw solutions. Technicians can easily install a PIR router in an hour, whereas the other solutions take a day or several days to get running.

Finally, PIR provides an elegant solution for dealing with NetBIOS broadcast problems. Such broadcasts are prevented from unnecessarily polluting WAN links, resulting in significant increase in WAN efficiency, further delivering good performance for SNA traffic.

To successfully integrate SNA and LAN networks, you must understand the issues. TCP/IP encapsulation requires a deep investment in WAN bandwidth, staff expertise, and doesn't deliver the performance or reliability you need. DLSw is only marginally better than TCP/IP encapsulation. But PIR delivers both SNA and LAN packets efficiently and reliably. PIR ensures that SNA traffic gets through, LAN traffic doesn't starve, handles messy NetBIOS broadcasts, and rapidly reroutes around congestions and link failures. Plus, it's easy to install and maintain. ■

HOW SNA FARES

	PIR	TCP/IP Encapsulation	DLSw
Response time	constant	unpredictable	unpredictable
Rerouting around congestions	yes	no	no
Rerouting around failures	3 seconds	30+ seconds	20+ seconds
SNA session loss	never	often	sometimes
NetBIOS broadcast resolutions	100%	some	some

PremierBank

PREMIER BANK'S FIRST-RATE NETWORK

CROSSCOMM ROUTERS KEEP EVERYTHING ON-LINE

Despite the many challenges of integrating SNA and LAN networks, Premier Bank is using CrossComm XL80 and XL10 multiprotocol routers to successfully integrate its statewide network.

- **MULTIPROTOCOL.** CrossComm XL routers support multiple protocols, even ones that lack a Network-Layer address, such as SNA and NetBIOS.
- **SNA AND LAN PERFORMANCE.** CrossComm XL routers' Protocol Independent Routing (PIR) enables both SNA and LAN traffic to share the road fairly. PIR ensures that SNA sessions do not time out, while assuring that LAN protocols get sufficient bandwidth as well.
- **FAIL-SAFE NETWORKING.** CrossComm XL routers reroute around WAN line failures and congestions. They have a dial-backup function. And CrossComm routers are fail-safe from the start, with no single point of failure.

The path to successful SNA and LAN integration can be as mysterious and treacherous as the Louisiana bayous, but Premier Bank has found the fail-safe road. Premier Bank, a statewide Louisiana bank, has always relied on its SNA network to expand and protect its $4 billion in assets, but LANs have recently come into play. So the challenge now is interconnecting the SNA networks in its branches with the LANs in its Baton Rouge headquarters.

Few networks are homogeneous, and Premier Bank is no exception. Spread over the corporate campus are Token Ring networks running Novell NetWare. In addition to standard network applications such as electronic mail, Premier Bank disburses retail loans and prepares loan documents over its LANs. The Bank's trust department depends on DEC VAX, Prime, and IBM RS/6000 hosts for its applications, and Ethernet and LAT are king.

Premier Data Services understood that the LANs in the corporate headquarters were only the beginning. 3270 applications would be supplemented by PC applications, yet SNA applications were the core of the banking business and couldn't be swept under the carpet. Premier Data Services knew to prepare for the future when one network would carry all traffic, SNA and LAN included.

To take a step into the future, Premier Data Services decided to invest and entrust its resources with the CrossComm solution. CrossComm offered a fail-safe transition strategy for the mission-critical network and a product mix to carry the various types of traffic within the network. CrossComm's ability to handle a homogeneous environment, while offering the same reliability and response times as when the SNA and LAN networks were separate, is a competitive advantage for Premier.

A SINGLE NETWORK PAYS DIVIDENDS

"We wanted to build a single, large highway for all the data," says Ben Baker, Premier Data Services' vice president. "We also wanted to position ourselves for future applications, such as videoconferencing, as well as voice and data flowing over the same pipe."

Premier examined its options, and decided upon a router-based network. Only multiprotocol routers would accommodate the jambalaya of protocols in the bank's network. "Multiprotocol networking was the biggest issue in this integration," says Baker. "We wanted to be able to put Ethernet, IPX, some NetBIOS, our regular SNA traffic, and TCP/IP, if a requirement came up, over the same pipe."

Premier Bank understood the merits of having a single network: convenience, flexibility, and cost savings. Baker uses an analogy to explain his point: "We have an interstate highway right outside our building. If the inside lane could be used only for trust applications, the second lane could be used only for SNA traffic, and the third lane only for IPX, and the fourth lane only for NetBIOS, what happens when there is a lot of bursty NetBIOS traffic? Even if there's nothing in the other lanes, I wouldn't be able use them. I'm wasting bandwidth." Premier Bank has a private T-1 network. It owns the multi-lane road; therefore, it must use the bandwidth efficiently.

Premier Data Services decided

"For Premier Bank, multiprotocol networking was the biggest issue in integrating our SNA and LAN networks... We insist on 98 percent uptime, and so far our CrossComm routed network has delivered."

— Ben Baker
Vice President
Premier Data Services

on CrossComm's Protocol Independent Router (PIR) as the solution to SNA and LAN integration. PIR helps the SNA and LAN traffic share the same road. So far, Premier Bank has successfully put IPX, SNA, and NetBIOS on its WAN."We have not seen any problems," says Baker. Protocols with a Network-Layer address, such as IPX, can be handled as deftly as those without, such as SNA and NetBIOS. In addition, because of the PIR's SNA prioritization feature, SNA traffic is guaranteed to get the response time necessary to maintain user sessions.

MOVING FROM 3270 TO PC

Premier Bank is in the midst of reengineering its business processes and looking at additional automation possibilities at its branches. Premier Data Services is entrusted with delivering sufficient WAN bandwidth to support the new crop of PC applications. To gain that WAN bandwidth, Premier Data Services could upgrade its lines to higher speeds, but that means replacing modems and upgrading front-end processors — a costly venture. By building a multiprotocol, routed network with CrossComm routers that takes into account the different applications' bandwidth requirements, Premier Data Services can deliver a higher speed, more reliable network without a significant increase in cost.

FAIL-SAFE NETWORKING

Efficiency and new applications weren't Premier Bank's only reasons to build a single routed network. Fail-safe networking is key. "We wanted a methodology for disaster recovery that was feasible," says Baker.

If there's a failure in the T-1 network, the PIR routers can reestablish the connection by automatically dialing up the public-switched telephone network. For its SNA network, each Premier Bank region has multiple 9600-bps dial backup lines, which can connect to the central disaster recovery site in Florida.

Premier Bank insists on 98 percent uptime, and so far, its routed networks have delivered. Premier Bank doesn't have to worry about a single router taking down the entire network. Also, CrossComm's PIR routing software can quickly reroute around congestions and line failures, ensuring that even time-sensitive SNA sessions stay up and running.

Premier plans to remesh its private T-1 network, which will allow the CrossComm XL routers to reroute all sessions in less than five seconds if a single line fails.

THE DAILY BALANCE

For Premier, CrossComm XL routers deliver the necessary performance, are reliable, and are easy to install. For its day-to-day management, Premier Bank's Data Services department uses CrossComm's Internetwork Management System (IMS) software to manage the routed network, Cabletron's LANView to manage the hubs, and IBM's NetView to manage VTAM. Baker is pleased with the simplicity and functionality of IMS.

Despite the many challenges of integrating SNA and LAN networks, Premier is banking on CrossComm's fail-safe solution to deliver the performance, protocol sensitivity, fail-safe networking, and uptime essential to any financial institution's mission-critical core network. Premier Bank has made a wise investment. ■

WHO IS CROSSCOMM?

This special supplement is brought to you by CrossComm Corporation. The company's mission is to build fail-safe networks for IBM customers transitioning to LANs and client-server networks. The company is a global leader in providing internetworking products, service, and support optimized for IBM computing environments. In winning Data Communications Internetworking "Hot Product of the Year" award, for the ILAN XL80 backbone router, the magazine wrote, "CrossComm is the only company that delivered a box that guarantees mission-critical applications get the top priority they demand." (Data Communications Magazine, January, 1994). And, the June, 1993 SoundView/Gartner Group bridge/router vendor survey rated CrossComm number one in service and support and by a wide margin, number one in price/performance.

BUILDING FAIL-SAFE NETWORKS

Consolidate your SNA and LAN networks into one WAN, and your company has all of its core business applications riding on a single system. Now that's mission-critical. To successfully integrate SNA and LAN networks, you must build a fail-safe network.

To make a network safe from failure, the network design must take into consideration the network complexity and the high probability of failure. A fail-safe network has no single point of failure. Your network design should enable the network to suffer a failure, yet still run the mission-critical applications.

Designing a fail-safe network requires three elements:

- Fail-safe network topology;
- Fail-safe routing software; and
- Fail-safe routers.

FAIL-SAFE NETWORK TOPOLOGY

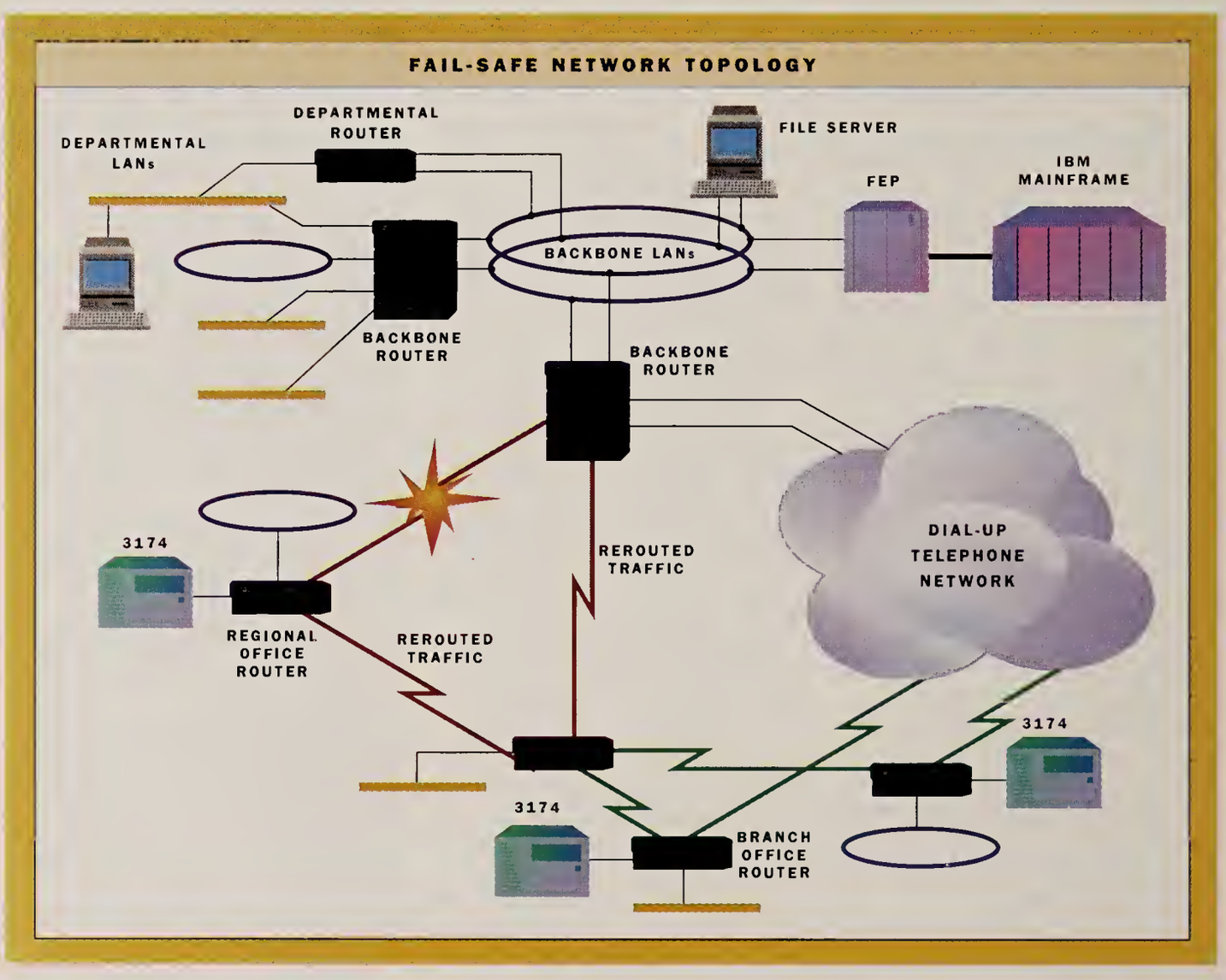
To design a fail-safe network, you must use the proper network topology. The principle design consideration is to provide multiple paths between computers, so if one path should fail, another can take its place.

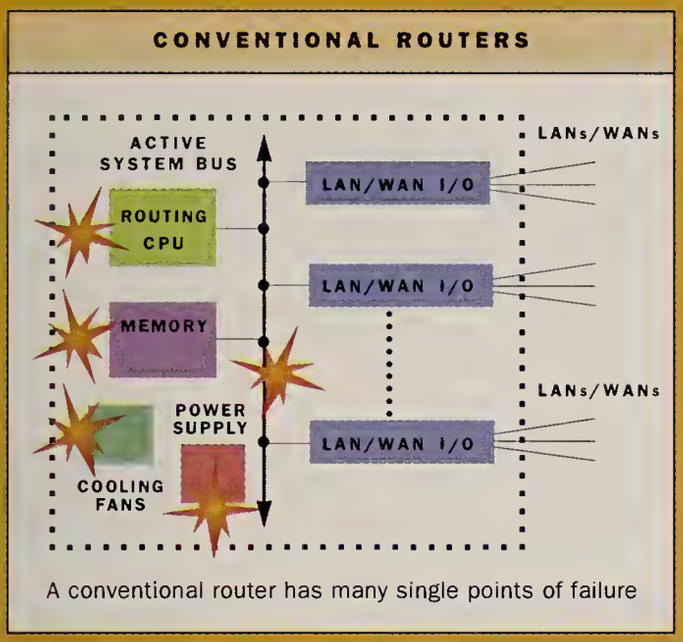
The network configuration shown in the figure below is a dual-backbone LAN with critical components, such as FEPs, file servers, and routers, connected to both backbone LANs. Departmental LANs should be connected to the backbone via one or two routers. A dual-router configuration is more reliable, but very costly. A dual-router configuration also is not fully fail-safe because a LAN failure can block communications for all computers on that LAN. Many more networks use a single router to connect departmental LANs to the backbone. In this configuration, the router's reliability and its architecture is critical.

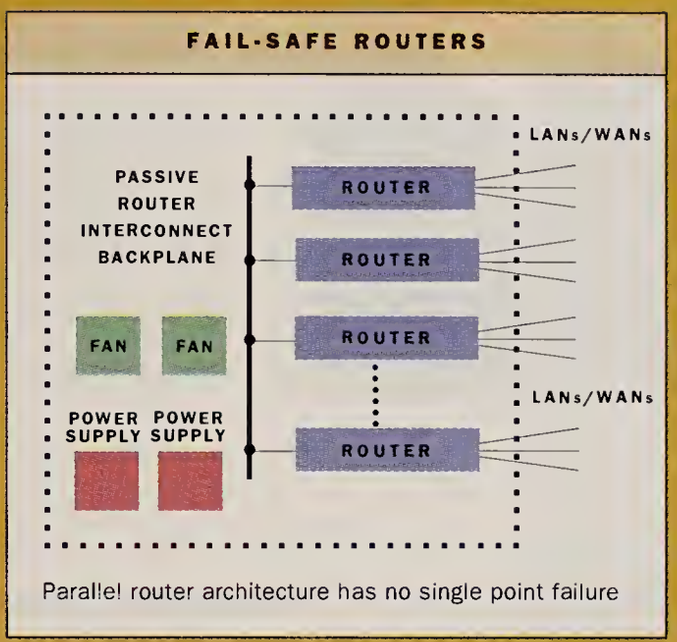
The LANs in regional offices or remote offices are typically connected via multiple WANs using the triangulation method also shown in the figure below. Triangulation protects against the failure of a single WAN link, but its success depends on the routers' reliability. Small branch office LANs are typically connected via single WAN links to save the high cost of WAN lines. Routers that can switch to a dial-up line are often used to provide an alternate path via the public switched telephone network.

FAIL-SAFE ROUTING SOFTWARE

A fail-safe network topology requires that routers know how to







select an alternate path in the event of a network failure, so the second backbone, which can be a triangulated WAN or a dial-up phone line, can be used to ensure connectivity and deliver response times necessary to keep applications running and users happy. The software inside the routers selects the alternate path and handles the rerouting.

Rerouting takes time; routers must first detect network congestion or a failure, then find an alternate path, if one is available. While rerouting is occurring, users will experience a delay. Common routing software such as RIP, IGRP or OSPF, takes 30 to 60 seconds to reroute around a network failure. This lengthy amount of time isn't a problem for LAN applications. NetWare, TCP/IP, DECnet, and AppleTalk are designed to withstand prolonged network delays of up to a minute without losing sessions.

But SNA users aren't so fortunate. SNA-based applications or Digital Equipment's LAT-based applications cannot tolerate delays longer than a few seconds; they will time-out. The end result is the users' sessions will drop. And the help desk will be inundated by calls from irate users.

The Protocol Independent Router (PIR) can deliver the necessary response time. The PIR router uses very fast rerouting protocols known as Distance Shortest Path First (DSPF), which typically offers rerouting in three seconds.

Traffic prioritization is an important element of fail-safe routing. If a link fails, all the traffic from the failed link will be directed onto an alternate path. But that alternate path may already be very busy. Additional load would only cause significant congestion and session time-outs for both existing and new traffic. Prioritizing key types of traffic, such as SNA or certain applications, ensures that critical applications run in the face of congestion. Using PIR routing software, you can prioritize traffic by protocol, application, or individual computer.

FAIL-SAFE ROUTERS

A fail-safe router is the third element of fail-safe networking. The routers that connect multiple remote locations and the departmental LANs to the backbone are the most critical single points of failure. You can't be too careful when selecting these routers.

Most routers aren't designed for fail-safe networking, since they themselves contain many single points of failure (see figure above). If a router module, power supply, or fan fails, the router will fail as well. To compensate for their shortcomings, you will have to use a dual-router configuration, which is more expensive, more complex, and can be ineffective for SNA traffic.

You need a fail-safe router. A router that implements a Parallel Router Architecture with no single point of failure. These routers consist of multiport modules which plug into a chassis fed by multiple, power supplies and cooled by redundant fans. The router modules are independent, but interconnected via a backplane. With a Parallel Router Architecture, if a router module, power supply, or fan fails, the router stays up. In a fully configured backbone router, any one of several router modules can fail without affecting the operation of the others, so the router keeps the network running.

With a router implementing Parallel Router Architecture, all modules are hot swappable, which allows technicians to service a failed component while the router is operating. You can't service a failed component of a conventional router on-line, since the entire router must be rebooted, thereby taking down all, or part of the network. A router with Parallel Routing Architecture is easily serviced on-line.

A Parallel Router Architecture router is also scalable. As LANs and WANs are added, you can add more router modules, and each router module adds more processing power. Conventional routers aren't scalable, since the single routing processor is forced to run the entire router, regardless of how many LANs and WANs are connected.

When integrating SNA and LAN networks, plan for fail-safe networking. The network topology should not contain a single point of failure. Choose routing software that can rapidly reroute around congestions and link failures while maintaining SNA sessions. When selecting a router for an integrated SNA and LAN network, ensure that it contains redundant components, is scalable, and can be serviced on-line to guard against failure. The network should not contain any single points of failure to ensure true fail-safe networking. ■

"The SMS network must provide consistent performance, be resilient to failure and be easily managed ... the CrossComm solution met all the criteria."

— Tom Riesenberg
Department Manager, Network Services
SMS

SMS

SMS: FINDING A PRESCRIPTION FOR SUCCESS

Imagine maintaining an 80,000-user, worldwide SNA network. Now add the demands of a changing health-care industry. Mix in NetWare, VAXs, UNIX, and virtually any other server, host, or network type the users want. Sound like a tough job?

That's Tom Riesenberg's job description. "It's a very exciting time," he says. Riesenberg is the department manager of Network Services at Shared Medical Systems (SMS), the largest provider of health-care systems in the United States. Of the 4,000 SMS employees worldwide, 200 are dedicated to providing network services to its customers, which are hospitals and other health-care institutions.

"The emergence of client-server applications is driving new network requirements," says Riesenberg. SNA was the heart of the business, but the development of new client-server applications and imaging technologies is changing the way networks are structured. "The network used to be a traditional connection to the Malvern, PA data center, now our host mainframes are often nodes on customer networks," adds Riesenberg. "What hasn't changed is the need for consistent, high quality performance 24 hours a day, every day."

Whereas SMS once had a typical SNA network with 3745 controllers, and SDLC links, it now has successfully integrated its SNA and LAN networks with fail-safe networking solutions from CrossComm. The network consists of a redundant Token Ring backbone, dual NCPs with duplicate Token Ring Interface Coupler (TIC) addresses, which are connected via CrossComm XL routers to its client sites.

SMS's mission is simple: Keep customers happy by cost effectively delivering the high quality applications and services they want, any time they want. Achieving that goal is a challenge. SMS believes in preserving its customers' investment in their existing technology, so the network must accommodate a long list of protocols, including ones with Network-Layer addresses, such as IPX, TCP/IP, and DECnet, and those without, such as SNA, NetBIOS, and LAT.

SMS's greatest challenge is to deliver consistent and constant service. While most companies' MIS shops deliver service to their own employees, SMS's networking group serves health-care customers worldwide. "Our customers require excellent response time and uncompromising reliability," says Riesenberg. "The bottom line is the network has to stay on-line."

In addition to accommodating any protocol, the SMS network must provide consistent performance, be resilient to failure, and be easily managed. Accommodating multiple protocols means a routed network. But finding a router that could also handle non-routable protocols and dynamically shift the traffic load in the event of a WAN line failure was no easy job. Only CrossComm XL routers met all the criteria.

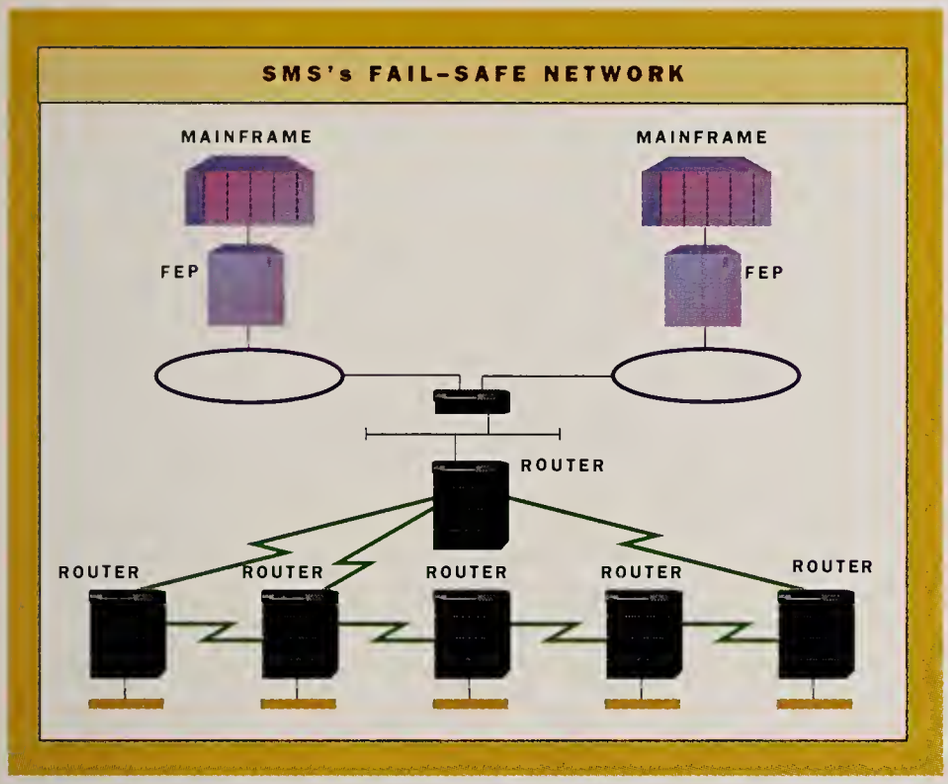
KEEPING USERS HAPPY

Riesenberg has not experienced problems with SNA session time-out. With 80,000 SNA users, the importance of speedy response time can't be overstated. CrossComm XL routers' Protocol Independent Routing (PIR) software deftly handles the routable

CROSSCOMM'S PIR: THE CENTRAL NERVOUS SYSTEM

CROSSCOMM XL ROUTERS MET ALL THE CRITERIA

CrossComm's own Protocol Independent Routing (PIR) software is optimal for handling mission-critical SNA traffic in internetworks. Further, the fail-safe XL routers are ATM/APPN ready, and are designed for nonstop networking. Product features such as hot-swappable router modules, redundant router components, and special software to maximize network availability and high-speed processing, via a multi-RISC processor design, are critical for the IBM network transition.



and nonroutable protocols alike, delivering a high quality of service to SNA users. The network carries SNA, IPX, TCP/IP, LAT, and DECnet.

SMS's fail-safe network design includes plenty of redundant components and alternate paths. If a WAN line fails, the XL routers dynamically reassign the paths without the users knowing. "With IP encapsulation, however, if we had a mesh and we lost a link, the sessions wouldn't stay up. PIR can dynamically reroute to an alternate path in less than two seconds. Users don't even notice the link failure," says Paul Schmidt, senior network programmer at SMS.

KEEPING THE NETWORK HEALTHY

Remote management is the backbone of SMS's business. "We couldn't even begin to think about building a network without an efficient and effective management strategy," says Riesenberg. At SMS, most network management functions are automated. The network can detect an outage, catalog it to a database, and try to recover from the outage. If the system can't recover itself in 30 seconds, the management application notifies the operator and the customer service people. To make management automatic, SMS uses products from IBM, Legent, and CrossComm, plus some custom-developed software.

"CrossComm Virtual On-Site Technology (VOT) is essential to our network management goals. Their software and service offerings have helped us effectively isolate and remedy over 90 percent of our customer network problems remotely," says Riesenberg. In addition to troubleshooting and diagnosing problems, regionally based network engineers handle the basics of network installation, but all router configuration is done remotely from Malvern. SMS can install a new router in the field, while the staff in the data center handles the configuration remotely.

"Network configurations can be complex and often require a team of integration specialists. CrossComm XL routers provide a solution to address these complexities. Our customers can realize the full potential of their health care application investment," says Schmidt. ■

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Microsoft promotes streamlined NT

NT strategy takes aim at one-vendor purchasers

By Stuart J. Johnston

As Microsoft Corp. readies the beta test of Daytona — a smaller, faster version of Windows NT — AT&T is preparing to market Microsoft's other server products with NT-based server machines.

Although AT&T officials would not give any dates, partly because not all of Microsoft's server products are available yet, they acknowledged that such an offering will be announced "in the very near future."

"When I can go convey an entire systems management strategy based around NT and things like Hermes and EMS, this is compelling," said Keith Carlsen, director of NT marketing in AT&T's multiprocessing server division.

Hermes, Microsoft's code name for its systems management server product, and Enterprise Messaging Server (EMS) are due out this year. Other Microsoft server products that will be included in the AT&T offerings, such as SQL Server and SNA Server for Windows NT, are already shipping.

"We'll be able to offer the soup-to-nuts kind of solutions that people want, along with complete service," said Jack Steeg, systems vice president for NT marketing at AT&T Global Information Solutions in Dayton, Ohio.

AT&T's strategy is directed toward customers who grew used to the paradigm for purchasing mainframes — going to a single vendor for everything.

"Now you're seeing a shift to a more horizontal paradigm, and some customers are put off by that," Carlsen said. "They're saying, 'Put it in a package and deliver it to us with support.'"

More servers

Although AT&T officials declined to comment, sources who had been briefed said they expect AT&T will also offer multiprocessing server packages bundled with other major vendors' server databases, including those from Oracle Corp. and Informix Software, Inc.

The Daytona beta test, originally slated to begin in March, will "absolutely" begin this month, a Microsoft spokeswoman said.

Microsoft will release beta versions for Intel Corp., Mips Technologies, Inc. and Digital Equipment Corp. Alpha processors simultaneously, said Rich Tong, director of marketing for NT. The beta release will eventually be sent to "well over 10,000" users, Tong added.

Daytona, which will be available in both desktop and Advanced Server editions, will have a smaller, faster 4M-byte kernel and will run 16-bit Windows applications faster than the current versions do, Tong said. Among the improvements is the option to run each Windows application in its own protected memory space so that if one crashes, it will not bring down others.

The update will also feature the OpenGL three-dimensional graphics libraries, which Microsoft licensed from Silicon Graphics, Inc., in both versions, and provide significantly improved support for third-party networking, especially TCP/IP and Novell, Inc.'s NetWare. Also featured in the server edition is support for the Dynamic Host Configuration Protocol (DHCP) and the Windows Integrated Name Server (WINS), which were designed to alleviate many network administration problems by automatically assigning and tracking PC addresses.

What's in Daytona?

- A 4M-byte kernel that is smaller and faster than the original NT kernel.
- Separate memory spaces for 16-bit Windows applications.
- Improved TCP/IP and NetWare support.
- OpenGL 3-D graphics libraries.
- DHCP and WINS support (NT Advanced Server).
- Peripheral Component Interconnect bus support.
- Interoperability between 16- and 32-bit OLE applications.
- Improved account management tools (NT Advanced Server).

Major component

While many industry observers view Daytona as an interim release of NT, a confidential Microsoft memo obtained by *Computerworld* [CW, March 28] shows that it is much more than that in terms of its importance to the company's NT strategy.

The memo read in part, "We need people to buy NT [Advanced Server] today, and we want them to feel comfortable that the upgrade will be painless and a safe event. We absolutely don't want a long evaluation cycle with Cairo." Cairo is the code name for the next major version of NT, due in the first half of 1995. It will feature support for distributed Object Linking and Embedding (OLE) and a completely new object file system.

New York's Met opens Windows to art world

By Ed Scannell

■ The Metropolitan Museum of Art, an institution practically synonymous with the word "culture" in New York, is in the midst of an aggressive push to "smartsize" a significant portion of its computer operations from host-based systems to a client/server implementation.

ON SITE

Metropolitan Museum of Art
New York

Challenge: Develop multiple NT-based applications, including tracking and data collections for textiles in the Antonio Ratti Center for Textile Study.

Technology: Windows NT and NT Advanced Server running on Sequent Computer, Inc. WinServer 3000s.

Results: Better tracking of textiles as they come into the center.

The new distributed computing strategy, which has Microsoft Corp.'s Windows NT and Windows NT Advanced Server at its heart, is intended to make the museum's business and art sides more efficient.

While the art side of the museum is obviously well-known, its business side is not. And make no mistake — "The Met," as it is called by many New Yorkers, is big business.

The museum has a coast-to-coast network of retail outlets that contribute to a yearly dollar sales volume of more than $100 million. Of that amount, $35 million is generated through the museum's mail-order business, $5 million through wholesale and $60 million through retail sales.

Spearheading the downsizing effort is Arthur Tisi, the museum's 32-year-old chief systems officer. Tisi is overseeing development of a number of Windows NT-compatible applications, including one that will better track some 42,000 museum pieces that are scheduled to be housed in the Antonio Ratti Center for Textile Study now under construction.

"I was hired as a 'change agent,'" Tisi said. "The technology was evolving, a lot of it spearheaded by our own business growth and the impetus of the curators, who were bringing in new technology."

But before he chose Windows NT and NT Advanced Server, Tisi entertained bids from a variety of software and hardware suppliers, including several divisions within IBM.

DANIEL VASCONCELLOS

Lack of unity

The museum was already using IBM host systems, including a 4381 and 9377, to run its financial and merchandising applications. Tisi said he thought IBM might be able to offer a smooth transition to a client/server strategy whereby the museum could create more flexible applications less expensively. But that did not prove to be the case.

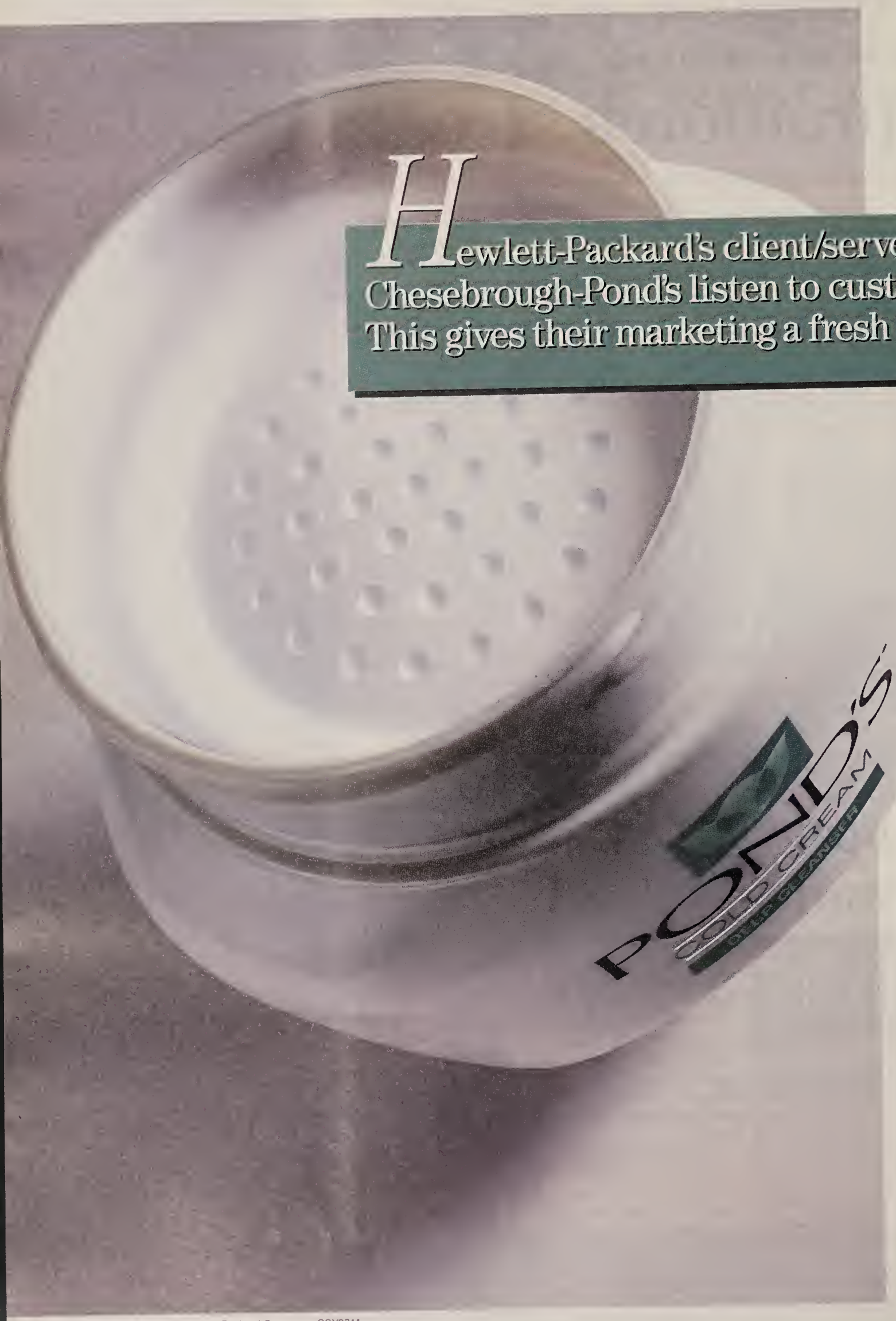
Tisi talked to representatives from several IBM product lines, among them the ES/9000, AS/400, RS/6000, PowerPC and OS/2 groups, all of whom pitched their strategies in an overly competitive manner, he said.

"There was no unifying vision for the technologies," Tisi said. "There seemed to be a lot of contention among the groups."

Microsoft's solution, Windows NT Advanced Server coupled with SQL Server, seemed the most able to take the museum where it wanted to go in the short and long term. Also, Microsoft's offer of an unlimited site license for just $14,000 did nothing to hurt its chances of winning Tisi over.

"As a 1.0 release [Windows NT], I have rarely seen a more stable programming environment," Tisi said.

The Met, *page 62*



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— Gene Goodmaster,
Director of Management Information
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Think again.

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Oracle targets client/server competition

By Kim S. Nash

■ Oracle Corp. is expected to announce today a new generation of 25 client/server applications. The Release 10 product set breaks ground for Oracle in that the firm plans to reveal certain specifications that let third-party software houses integrate their products with the new applications.

The efforts at openness and the addition of new features are part of a planned Oracle assault on SAP America, Inc. and other client/server software rivals, officials said.

Oracle is "a strong player in this area and is a force to be reckoned with," said Jennifer Sealtze, an analyst at International Data Corp. (IDC) in Framingham, Mass.

The database maker led the client/server accounting and human resource applications market for 1993 with a 24% chunk of nearly $300 million in sales for the segment, according to IDC. PeopleSoft, Inc. ranked second with 15%, followed by SAP with 13%, IDC said.

And the market is growing. Three years out, sales are expected to more than triple to $1 billion, IDC said. Kidder, Peabody & Co., a New York brokerage house, is more optimistic, estimating $1.7 billion in revenue by 1996.

Release 10 applications were designed to run on Unix, OS/2 and Windows. Among the new features and programs are the following:

- Rapid implementation tools designed to make installing Oracle applications faster by, for example, walking managers through configuration procedures on-line.
- Cooperative Application Initiative, a program under which Oracle will publish application programming interfaces for the systems so third-party developers can either hook their applications into or build add-ons for Oracle packages. BMC Corp., for example, plans to integrate its Patrol systems management tools with applications within Oracle Financials and Manufacturing.
- Technology centers, co-run by Oracle and several hardware makers, are under development. The centers will test specific hardware/software combinations for users looking to install Oracle applications. The centers will also recommend systems management tools for users new to client/server, said Greg Brady, Oracle's newly appointed vice president of worldwide applications.

Graphically formed

Existing Oracle applications were built with character-based development tools, while Release 10 is the first set of packages from Oracle created with Oracle's Forms 4.0 and other graphical tools. For many shops, moving to Release 10 would require a tools upgrade if they had modified previous applications.

Early this year, DSC Communications Corp. bought $3 million worth of financial and manufacturing applications from Oracle but has yet to go live with the software. Release 10 packages could be part of the Plano, Texas-based conglomerate's future, but for now DSC is still modifying the packages to add features specific to the jobs of an estimated 4,000-person user base worldwide.

Ironically, Oracle was not the first software maker to introduce applications created with Forms 4.0. Design Data Systems Corp., based in Largo, Fla., shipped several financial packages based on Forms 4.0 last month.

Release 10 packages will roll out in phases, starting late this month and culminating in September, Brady said. Pricing has not been set but is expected to be figured on a per-user basis, he added.

Oracle previously priced applications according to the type of module and the projected hardware platform in question, as well as the number of users on the system.

The new products require the latest version Oracle database, Oracle 7. Further, Brady acknowledged that users will not be able to activate some of the features in applications without future releases of Oracle 7.

For example, although Release 10 applications "were designed from scratch to support distributed" computing, full-function distributed schemes that include data replication cannot be mapped out, Brady said. The process of replication keeps information in separate databases synchronized when the databases are at different sites. Users must wait for that capability until mid- to late 1994, when Oracle is expected to ship Version 7.1 of its database.

Some users, such as AT&T, are anxious for the parallel query and other parallel features promised in Oracle 7.1. The human resources department at AT&T currently runs Oracle applications on an NCR 3600 platform, said Arthur Friedman, a systems engineer. The department will likely go parallel when the function is available, he said, to improve processing time and scalability at AT&T, one of the largest companies in the world.

Step up

Greg Brady, a six-year Oracle veteran, was promoted to vice president of applications early this year, a new position at Oracle. Brady was most recently regional vice president of applications sales for the Dallas area. According to Brady, Oracle has sold 1,500 licenses for various application modules, and 1,100 users are in production with the systems.

Signed up

Nineteen third-party software makers have so far signed up to integrate their packages with Oracle client/server applications, including Business Objects, Inc., Clarify, Inc. and Sterling Software, Inc.

Holiday Inn hits snags in its plans for client/server setup

By Rosemary Cafasso

These days, Holiday Inn Worldwide is a worn-out traveler on the road to client/server computing.

The company's client/server project, originally slated for completion in the spring of 1993, is on hold for the second time while its application vendor, Dun & Bradstreet Software, determines the cause of new performance problems.

D&B Software has promised Holiday Inn an answer by month's end. Currently, it looks like the hotel chain is not getting enough horsepower from its OS/2 server for its particular decision-support environment. A year ago, Holiday Inn halted the project because of a synchronization problem between the D&B Software host and server application platforms.

"It has been a fairly controlled pilot, so only the people involved in it have been disappointed, including me," said David Peach, a vice president of finance. "It is very frustrating when you can see the potential."

Earlier this year, Holiday Inn installed Version 2.0 of D&B Software's Smartstream decision-support software. While this fixed the synchronization problem, the new software was running at a snail's pace. Database downloads from the company's mainframe D&B Software system were taking up to four hours, Peach said.

Peach noted that while the problem could well be the IBM PS/2 Model 95 running OS/2, there could be other contributing factors, such as incompatibilities between the database data structures on the host and server platforms.

Gail Goodman, director of product management at D&B Software, said her team may determine that Holiday Inn would be better off with a "more broadly scalable" Unix platform.

She stressed that Holiday Inn's problems are specific to their environment and that there are dozens of other Smartstream decision-support software users who have not encountered problems. But she said this particular migration has been difficult, in part because Holiday Inn was such a "bleeding-edge" user.

"We were all on the same experience curve 18 months ago," Goodman said. "Now we have the technical expertise to help customers evaluate their own technical readiness. Part of it was learning where the roadblocks were going to be and now getting out ahead of them."

Learning from mistakes

For Holiday Inn, there are plenty of lessons learned, starting with more clearly understanding hardware and software requirements for a particular application up front, Peach said.

"I think you need to take what [the vendors] say and really go back to them with your proposals and make sure the detailed [system] specifications meet the software requirements," Peach noted.

Goodman said that while OS/2 is suitable for some decision-support environments, it is not necessarily the best choice for all customers.

By month's end, Holiday Inn should have another plan of attack to complete the client/server migration. If it requires a switch to Unix, Peach said the team will be ready. "It will be an undertaking but not earth-shattering," he said.

Briefs

HP upgrades workstation

Hewlett-Packard Co. announced a high-performance version of its HP 9000 Model 735 workstation that is based on a 125-MHz PA-RISC chip. The $39,995 workstation, including 32M bytes of memory and 1G byte of disk storage, will not replace older Model 735 units based on a 99-MHz chip. A $9,100 upgrade kit will be available when the Model 735/125 ships in the second quarter, HP said.

DG offers NT support

Data General Corp. has announced support for **Microsoft Corp.** Windows NT-based servers with its Clariion family of open storage disk arrays.

Novell warranty support

Novell, Inc. is partnering with **Sykes Enterprises, Inc.**, a Tampa, Fla., information technology company, to provide warranty support for Novell DOS 7, NetWare Lite and Personal NetWare.

ProLiant supports SAP

SAP R/3, an integrated enterprisewide client/server business system from **SAP Group** in Walldorf, Germany, will now be supported on **Compaq Computer Corp.**'s ProLiant server line.

Pop Your Users Into Just This Easily, And For

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Remove wrapper. Plug in. Serves a bunch.

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The Met

CONTINUED FROM PAGE 57

ment," Tisi said.

The museum's network consists of an IBM SNA network, an IBM minicomputer and a few Unix systems that connect to 20 file servers hooking up more than 1,000 PC users.

Customized applications

The museum already has a SQL Server-based application in place to better track financial data for its mail-order operation. Data from the retail outlets, such as local sales, inventory and accounting information, is sent back through the museum's SNA network to the SQL Server-based host system where it is consolidated.

Chief systems officer
Arthur Tisi: business growth is driving new technology

Using Microsoft's Visual Basic, the museum built another application to track both the expenses and art in traveling exhibitions that stop at the museum. This product also works with SQL Server under Windows NT Advanced Server.

But perhaps the centerpiece application, which also works with SQL Server, is the one that will track 40,000 pieces from all 11 of the curatorial textile departments in the 25,000-sq-ft Antonio Ratti Center. This marks the first time all 11 curators have agreed to house the textiles in a single location, a museum spokesman said.

Look but don't touch

The museum is developing a system to scan images of each textile object and store them digitally. This will allow potential buyers and scholars to view them — complete with detailed background information — without risking damage by taking them out of storage. Some of the museum's textiles date back more than 4,000 years and can be rather fragile.

Scanning the images, which has only recently begun, will cost in the neighborhood of $100,000 and will not be completed until late this year, according to Tisi. Each image takes up an average of 1M byte of storage, which means the images of the entire collection could take up some 40G bytes of storage — not including the text data associated with the images.

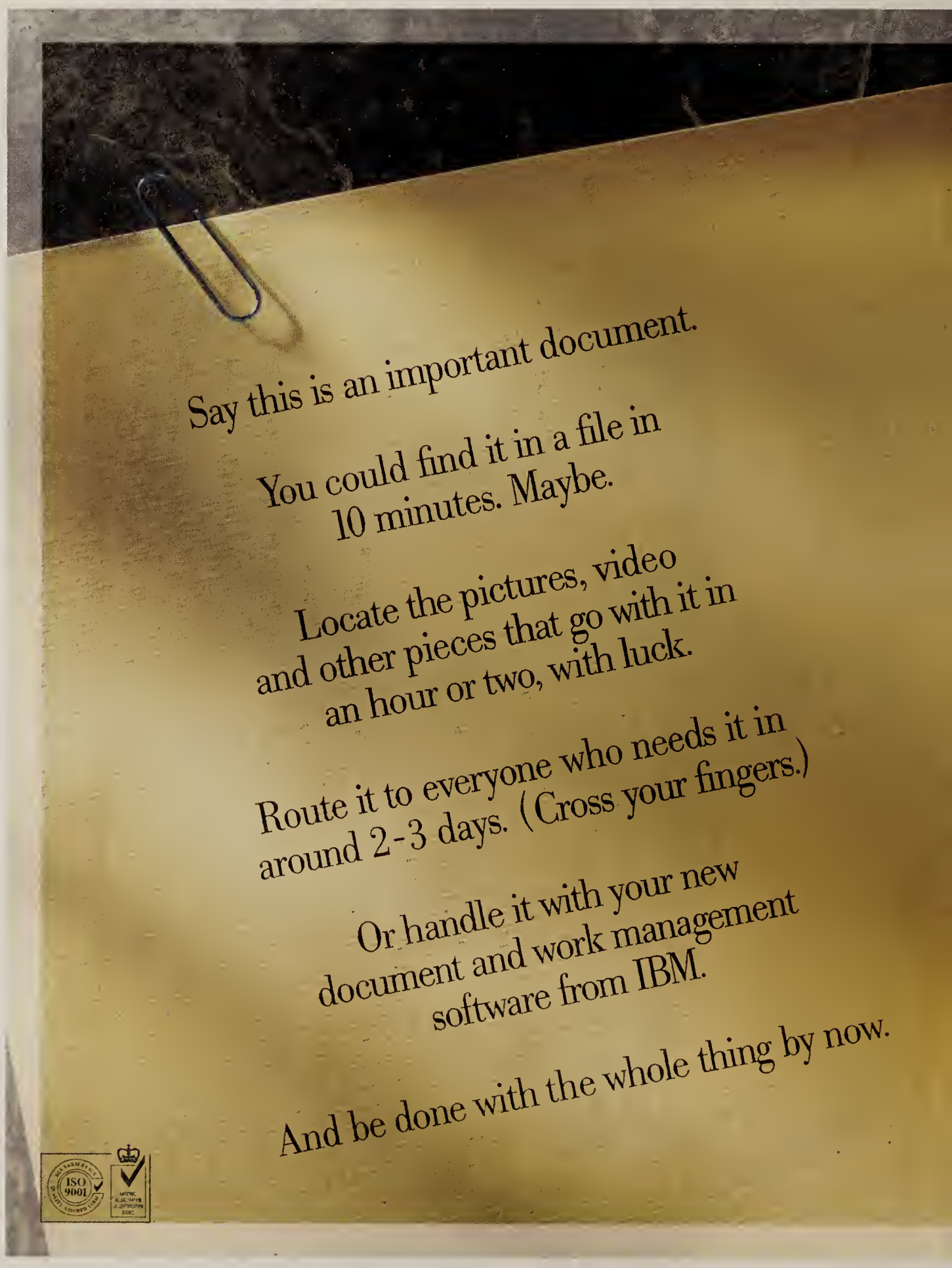
"The tracking screens with each image include data such as temperature, fumigation and special storage requirements. Some articles need to be moved either temporarily or to a more permanent facility," said Jay Hoffman, a consultant at Gallery Systems, Inc., which is working in concert with the museum to develop the applications.

> **"The museum's mission is one of education. If technology helps us to do that, we will do whatever it takes."**
>
> **—Arthur Tisi, chief systems officer**

The Windows NT-compatible application developed by the museum also has a built-in search utility that allows users to track art by content, material, color and donor with the use of a few key words.

Tisi is evaluating the possibility of setting up a dozen intelligent kiosks to give the museum's 4.5 million annual visitors a customized tour plan of the facility based on what they want to see.

"The museum's mission is one of education," Tisi said. "If technology helps us to do that, we will do whatever it takes."



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Poll finds security less than passable

By Gary H. Anthes

A recent survey of LAN security has revealed widespread neglect of the rudiments of password management.

Out of 35,250 users at 47 medium-size to large companies, nearly one in four had no passwords or easily guessed passwords, and 90% changed passwords infrequently (see chart).

The survey was performed by Kane Security Analyst (KSA), a software agent from Intrusion Detection, Inc., a New York-based software and consulting firm. KSA polls servers running Novell, Inc.'s NetWare operating system and looks for security loopholes in six areas: password strength, access control, user account restrictions, system monitoring, data integrity and data confidentiality.

KSA then compares the results of that evaluation against industry "best practices," said Robert Kane, managing partner at Intrusion Detection. For example, Kane said he recommends changing passwords every 30 days, using passwords with six or more characters and giving no more than 5% of users supervisory privileges on the LAN.

Insecurity

In a survey of 47 companies with 235 file servers and 35,250 users, Intrusion Detection found these security weaknesses:

Weakness	% of users
Infrequently changed passwords	90%
Passwords with too few characters	37%
Supervisory privileges	22%
Easily guessed passwords	20%
Inactive user IDs	14%
Tools that circumvent LAN security	14%

Keys to the kingdom

The survey also found that 14% of LANs ran software — some commercial products and some shareware — that is able to circumvent security. For example, some ran a commercial product that allows a user on a file server to reset the supervisory password. Intended for legitimate use when the password is forgotten, Kane said he has seen it abused on several occasions.

He said network administration groups often shared user identification numbers and passwords for simplicity. He said some companies also did that to hold down the number of user IDs, something on which Novell often bases its charges. "If one of these IDs becomes compromised, you've lost the keys to the kingdom," Kane said.

The Pillsbury Co. in Minneapolis just completed a five-month evaluation of KSA and is likely to install it at more than 50 sites in North America, said Paul Quanrud, manager of information security.

"Without a product like this, it requires an awful lot of manual effort to find out what your NetWare settings are," he said. "So you rely on spot audits and policy. And you are left with the question, 'How well do people follow policy?' "

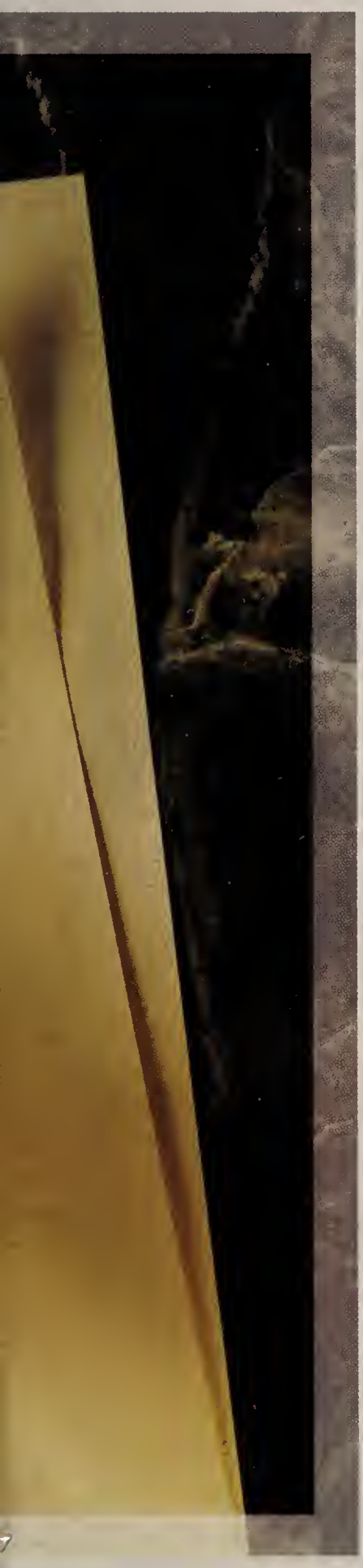
Quanrud said he found that every Pillsbury LAN had users who did not use strong passwords, something that would have been difficult to pin down manually. "This extends my security staff way beyond the people I have on board," he said.

Opposite ends

Kane said the survey revealed relatively good security at banks and financial institutions, which typically take robust security in the mainframe world and tailor it to LANs to which sensitive corporate data has migrated.

By contrast, Kane said, law firms had poorer security practices. "Law firm network administrators are often not security-literate," he said.

KAS is typically installed on a network analyst's workstation. It is priced at $995 per file server.



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Remote access

Shiva upgrades remote-access server

LANRover/Plus lets mobile users dial into server for quick access to networked applications

By Lynda Radosevich

Shiva Corp. in Burlington, Mass., is shipping an upgrade to its line of server and modem products for companies with mobile workers or branch offices that need to connect to the corporate LAN.

Called LANRover/Plus, the remote-access server permits DOS, Windows and Unix users to dial into the server and access applications on networks including Novell, Inc.'s NetWare, TCP/IP, Microsoft Corp.'s Windows for WorkGroups and IBM's SNA.

This remote-access server differs from the remote control method of remotely accessing LANs because it accesses the LAN directly. Remote control takes control of a PC at the corporate site and just sends the screen image over the remote connection.

The direct-access method is faster and easier to manage, said Jeremy Duke, a senior analyst at In-Stat, Inc., a market research firm in Scottsdale, Ariz.

"My main concern is speed," said David Porter, a communications and network systems manager at CarnaudMetalbox USA, Inc. in Cincinnati. Porter said he is beta-testing the LANRover/Plus in hopes of enabling salespeople in eight remote offices to access the corporate network for electronic mail and file transfer. "This is pretty slick," he added.

> "My main concern is speed. This [LANRover/Plus] is pretty slick."
>
> —*David Porter*
> *CarnaudMetalbox USA*

LANRover/Plus includes an eight-port rack-mounted access server that connects to Ethernet or Token Ring networks. It offers integrated V.32bis modems or asynchronous serial port connections to other modems.

If users choose the integrated modem design, they can manage the server and modems from a single Shiva or Simple Network Management Protocol console. Also, the integrated design eliminates messy cabling, according to Shiva officials.

Additionally, users can swap out the existing modems and replace them with speedier V.fast modems or Integrated Services Digital Network connections, Shiva said.

According to Porter, the benefits of the integrated model sound good but would limit him to Shiva's versions of the V.fast modem.

In response, a Shiva spokeswoman noted that users who want to use non-Shiva modems can choose the serial port version. However, they would then lose the benefit of integrated modems and servers.

In addition, LANRover/Plus now supports NetWare's Bindery security. It allows users to maintain a single list of authorized users on the NetWare server rather than maintain a separate list on the Shiva server, the company said.

Rival offerings

Shiva's main competitor in the remote LAN access server market is Telebit Corp. in San Jose, Calif. Telebit servers have around 40 ports and are geared more toward enterprise solutions, Duke said.

Other emerging competitors in the field include Cisco Systems, Inc. and Centrum Communications, which was acquired by 3Com Corp. in January, Duke said.

LANRover/Plus starts at $4,999 for the eight-port serial version shipping in May, and $8,499 for the eight-port integrated V.32bis modem version, which is available for Ethernet now.

The company said Token Ring support will be available later this year.

Verity outlines strategy for cross-platform application

By Ellis Booker

Already a favorite among software developers like Adobe Systems, Inc. and Lotus Development Corp. for its text search and retrieval engine, Verity, Inc. last week outlined a strategy for search agents that are platform-, database-, application- and on-line source-independent.

Verity's product will accomplish this cross-platform feat by using software agents. The technology, called InfoAgent, promises to filter and find information relevant to individual users.

"Users want to be able to retrieve information wherever it lives," explained Verity chairman and president Philippe Courtot.

"Companies are not going to have all their information just in Notes or in CC:Mail," he said.

The initial introduction, according to Courtot, is a revised software kernel that lives more easily within different application products, such as Notes. But Courtot promised a "cross-application" product — agents that can be integrated within an application or used as a stand-alone facility — before year's end.

In fact, Courtot said he anticipates the day when operating systems such as Microsoft Corp.'s planned Cairo have integrated text search and retrieval features.

"Our value is a tool that can go across [operating systems], and this is where Verity will get more and more of its value over time," he said.

Industry analysts called the strategy savvy.

The Verity InfoAgents are split into the following types:

- A watcher agent to monitor a stream of information looking for information that matches a user's predefined topic list.
- A searcher agent to actively seek and gather information related to a topic.
- An analyst agent to examine the body of information to summarize its content and organize the information according to the user's preferences.

Verity's InfoAgent Developer Kit 1.0 is available for Windows 3.1, Windows NT, Macintosh and several versions of Unix. The kit costs $9,500. It will be available at the end of this month.

Storing text of any size

Thunderstone Software in Cleveland is also offering a content-based textual search engine.

Thunderstone's Texis has a concept-based text engine called Metamorph, which uses a collection of fast, real-time pattern-matching algorithms, as well as a specialized relational database server. The combination, according to the vendor, allows users to store text of any size and query the information with a natural language interface.

The product supports up to 10,000 4G-byte tables per database.

Texis is available on Unix, Windows or Windows NT and costs from $4,300 (one client) to $24,000 (50 additional clients).

Watermark releases imaging server

By Stuart J. Johnston

Watermark Software, Inc. in Burlington, Mass., will ship this month a Windows NT-based imaging server that the company claims will compete with mainframe-based imaging servers.

The Watermark Professional Edition and Image Server enable users to incorporate scanned or faxed documents into client/server applications, the company said.

Professional Edition supplies a client-side component that supports Microsoft Corp.'s Object Linking and Embedding (OLE) 1.0 and 2.0. This gives users the ability to link images into productivity applications that support OLE, such as Microsoft's Excel spreadsheet.

Image Server works with Microsoft SQL Server and takes advantage of multithreading execution as well as symmetrical multiprocessor systems.

Watermark Professional Edition costs from $295 for a single-user license to $19,995 for up to 100 users. Watermark Image Server costs $2,995 for 25 users and $9,995 for 100 users.

Briefs

Dedicated sales

Standard Microsystems Corp. in Hauppauge, N.Y., formed a sales force dedicated to selling enterprise LAN switching systems to Fortune 1,000 sites in North America.

Users offer support

OpenVision in Pleasanton, Calif., a 2-year-old firm specializing in distributed systems management software, will get guidance and technical support from three large user sites: New York investment house **First Boston Corp.**, **Wells Fargo Bank** and **GTE Data Services**. OpenVision sells 19 systems management applications, most of which run on Unix machines. The firm, which received $28 million in a second round of financing last month, is designing object-oriented links that will allow the applications to run with multiple network management systems.

Navy signs Intergraph

Intergraph Corp. announced that the U.S. Navy has added its TD-2 technical workstations to the Navy's $422 million Facilities CAD-2 contract. The systems, which feature a 66-MHz Intel Corp. Pentium processor and 16M bytes of RAM, come with Windows NT preinstalled.

"The new client/server application looked great but crashed on takeoff!"

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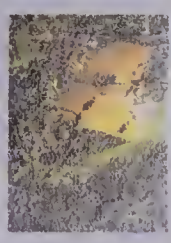

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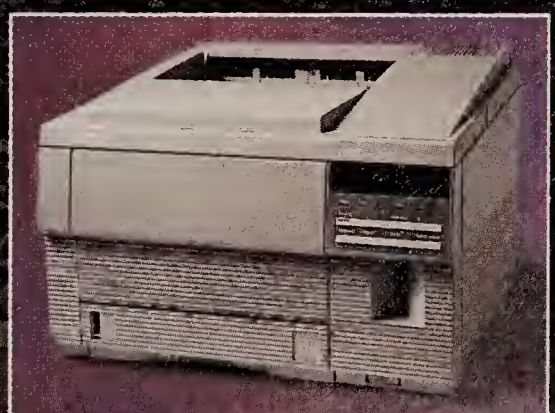

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New Products

Multiview Corp. has introduced Multiview Financial Software for Unix, financial software that includes general ledger and accounts payable applications.

According to the Burlington, Mass., company, Multiview General Ledger for Unix includes an on-line drill-down inquiry tool, enhanced security features and reporting tools.

Multiview Accounts Payable for Unix is a cash management and disbursement control application that offers an on-line policy table that can be tailored to meet company-specific needs.

Licenses range in price from $10,000 to $98,000.

▶ *Multiview*
(617) 229-2225

Newport Canyon Associates has announced Fileflo 3.5 for Windows, Windows-based document information management software.

According to the Irvine, Calif., company, the product gives PC and network users document information management capabilities typically found in larger systems.

Fileflo 3.5 offers an enhanced Windows interface, comprehensive digital scanning and image management with optical character recognition.

Other features include improved peripheral compatibility, automatic or customized indexing and the ability to import and store image files and other digital information.

A single-user version costs $1,095, and a five-user network version is available for $2,595.

▶ *Newport Canyon Associates*
(714) 833-0333

Highland Technologies, Inc. has introduced Highview for Workgroups, a document management application that incorporates workflow capabilities.

According to the Greenbelt, Md., company, the product integrates document scanning, optical storage and relational database management system indexing to create a full-featured system for managing and sharing documents.

Users can route a document to any user, to multiple users or to user groups.

The product also offers an indexing scheme that allows a basic document to be classified by type, title and multiple keywords. A document's index can be viewed at any time.

Highview for Workgroups costs $2,400 for six users.

▶ *Highland Technologies*
(301) 345-8200

SBT Accounting Systems has introduced VisionPoint Version 8, an integrated set of 16 multiuser accounting and business management applications for DOS and Unix.

According to the Sausalito, Calif., company, users can run VisionPoint straight out of the box or use its customization tools to create a product tailored specifically to their needs.

VisionPoint applications feature SBT's ReadyView browsing technology, which includes file browsers, instant inquiries and a business status report that forecasts revenue, check expenses, cash flow and gross margin. With this, users can project current totals to the end of the month at any time.

The single-user compiled version of VisionPoint costs $295 per module.

▶ *SBT Accounting Systems*
(415) 331-9900

AGE Logic, Inc. has announced XoftWare/32 for OS/2, 32-bit PC X Window System server software.

According to the San Diego company, the software complies with industry-standard X11R5 server technology. It enables networked PC and IBM PS/2 users to access graphical and character-based Unix applications and display them concurrently with OS/2 programs on a single PC screen.

Features include a comprehensive cut-and-paste capability for exchanging information between the PC and Unix host; AGE Logic's Network File Manager utility with file transfer and local printing capabilities; a fully interactive Telnet client; and a Concurrent Window Manager for simultaneous use and display of local and Unix windows managers.

The product costs $395 for a single user.

▶ *AGE Logic*
(619) 455-8600

RemoteWare, and the CONVERSION OF JARED FARRELL.

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A skeptic FROM WAY BACK, Jared Farrell the Salesman had outlived more than one attempt at automating field communications. The near-daily software updates. Nightly communication sessions that didn't. Inventory that wasn't. Prospects that...weren't.

So the fact that something called RemoteWare® had been implemented to automate sales processes for farflung laptop jockeys like himself had held little charm for Farrell. A client/server system built with software tools already happily in use in hundreds of large companies worldwide, with automated dial-up communications for transporting centrally-created electronic forms, documents and reports between home office legacy systems and even the most remote PCs? Terrific. Plus routing and query facilities to make sales-critical information simple to get and easy to use... on the road. Excuse me?

But within just days of the fading hook shot that sent the CIO's announcement memo into Farrell's round file, he was using the new applications electronically dispensed by RemoteWare. Entering daily orders, filing expenses, and penning a humble note of thanks to the CIO, from 30,000 feet. All quietly and automatically delivered by RemoteWare while he slept. A fitting complement to the inimitable selling routine of one Jared Farrell. Indeed.

Now, as he slid into the Central Office Staff Room six months later and five minutes late, Farrell watched the eyes of the room swivel towards him, like half a volley at Wimbledon. And the CIO and VP of Sales were headed his way with...a plaque? "Jared Farrell, Salesperson of the Year," it read. Salesperson of the Year. Imagine that.

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STILL MISSING!

Client/server management turns to CORBA

Enterprise too much for classic SNMP to handle

By Elisabeth Horwitt

The adoption of common standards among major distributed systems management vendors promises to answer some, but not all, of users' short-term needs in the client/server arena.

So far, the standard that most vendors have agreed on is the Object Management Group's Common Object Request Broker Architecture (CORBA). For example, Tivoli Systems, Inc.'s recently announced Tivoli Management Environment 2.0, a distributed platform for managing a range of server and client systems, is based on CORBA [CW, April 11]. Novell, Inc., OpenVision in Pleasanton, Calif., Microsoft Corp., IBM and Hewlett-Packard Co. are expected to follow suit.

Speaking the same language

Industry coalescence around CORBA would potentially ensure that applications on different management platforms could communicate.

"We definitely want one overall architecture, and everyone has agreed that CORBA is the underlying framework," said David Hart, an acting manager in systems management at GTE Data Services. The Tampa, Fla., firm uses a combination of applications from Tivoli and OpenVision.

Vendors have adopted CORBA by and large because their traditional Simple Network Management Protocol (SNMP)-based network management systems are inadequate for handling systems management across the enterprise, according to Jeremy Frank, a vice president at Gartner Group, Inc. The centralized polling configuration used in SNMP tends to overburden the management system and corporate network links.

CORBA provides a framework for dynamic interaction between the managing application and managed objects — anything from a device to a software package to a database transaction. The Tivoli Management Environment Version 2.0, for example, employs object request broker (ORB)-based communications to enable servers to notify one another of changes in a client configuration or a user account.

Further, users can write scripts to automatically initiate actions from a central console. For example, customers can download systems software as well as configure and initialize multiple PCs on the enterprise network, a Tivoli spokesman said.

However, CORBA is just the beginning of what networked systems management products will need if they are to handle the full spectrum of client/server management needs, said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington consultancy. "The issue is, how can a system scale up to serve an enterprise that can have hundreds of thousands or even millions [of devices]?"

Future intelligence

The answer, according to both Dzubeck and Frank, is a combination of distributed ORBs and intelligent agents that can sit on managed systems. These agents could report important events to a central station and also take action on their own using embedded scripts.

Some promising developments are in the works. SNMP Version 2 includes intelligent agents, although their intelligence is limited to filtering events and sending up only important ones. However, management platform vendors have been slow to support SNMP 2.

The Desktop Management Task Force's Desktop Management Interface (DMI) also includes intelligent agents for managing distributed PCs. The standards body plans to make the software developer's kit for DMI available in midsummer. Novell, IBM and Microsoft are among those promising DMI support in the near future.

Furthermore, Candle Corp., IBM and Legent Corp. are among those building

CORBA, *page 82*

Client/server wish list

Corporate users want their client/server systems management products to do the following:

- Be distributed across multiple domain managers.
- Automate the response to common events and problems.
- Reliably deliver information and commands between managing and managed systems without overburdening internetwork backbone.
- Interoperate among different vendors' platforms and applications.
- Manage a full range of client and server systems.
- Run on open, scalable, popular platforms such as Unix and Windows NT.

—Elisabeth Horwitt

Protocols

Internet experts grapple with explosion of users and demands

By Gary H. Anthes

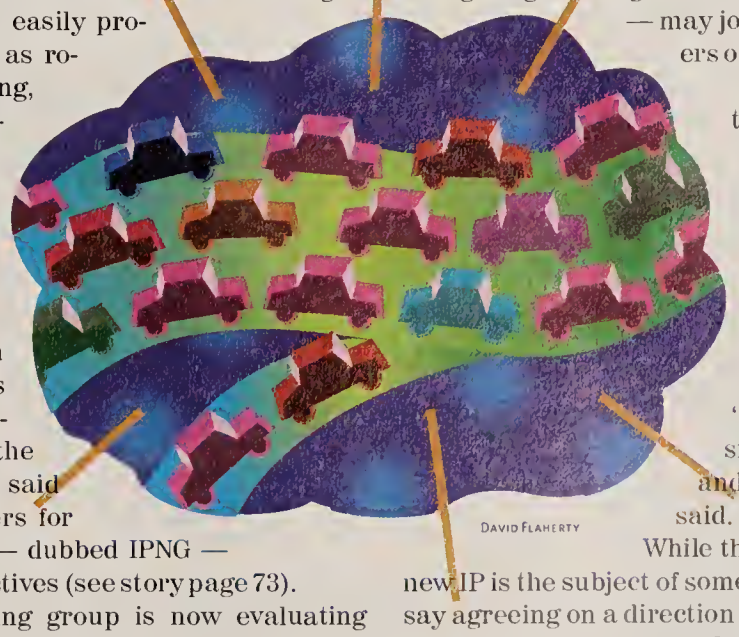
Just a year ago, Internet savants were in a mild state of panic over the explosive growth in the worldwide network of networks, which was reaching out to new users at the rate of 15% a month. Their concern: The 32-bit address space in the Internet Protocol — on which the Internet is built — was projected to run out of available addresses in as little as two years, leaving millions of would-be Internauts among the ranks of the information have-nots [CW, April 26, 1993].

But now experts are saying the current version of the protocol, IP Version 4 (IPV4), will not run out of steam until well into the next century, thanks to Classless Inter-Domain Routing (CIDR). This is a scheme for assigning and grouping addresses in a way that more flexibly defines network and host addresses, essentially allowing more address definitions.

Room to grow

"Barring some very large changes in the market, like the arrival of a huge number of TV sets needing IP addresses, we estimate that we will run out in about 2008," said Allison Mankin, co-area director for IP Next Generation, a steering group of the Internet Engineering Task Force (IETF).

But while CIDR has brought some relief, it is not enough. Although CIDR is extending the life of IPV4, the size and complexity of routing tables are straining the capabilities of today's routers. And users have begun demanding services not easily provided under IPV4, such as robust security, multicasting, auto configuration, mobility, resource reservation and policy-based routing.



"There are two things users care about," said Dan Lynch, chairman of Interop in Foster City, Calif. "One is the ability to accommodate new services, and the other is ease of use." He said any of the top contenders for the next-generation IP — dubbed IPNG — would satisfy those objectives (see story page 73).

Mankin's IETF steering group is now evaluating those contenders and is expected to announce its choice at the July IETF meeting in Toronto.

In a draft proposal submitted to the IETF in February, Robert M. Hinden at Sun Microsystems, Inc. said huge numbers of addressable devices — such as "nomadic personal computing devices," televisions and controls for lighting, heating and cooling equipment and motors — may join the flood tide of computers on the Internet.

Applications touching those devices will need a common protocol that can work over a variety of physical networks, support large-scale routing and addressing, impose a low overhead and support auto configuration and mobility. These markets "require solutions that are simple, robust, easy to use and very low cost," Hinden said.

While the urgency of the need for a new IP is the subject of some debate, Internet watchers say agreeing on a direction remains a pressing matter. The reason is that the IPNG will take years to implement because the Internet is so large and decentralized.

Internet, *page 73*

Vendors plan LAN/WAN links

By Stephen P. Klett Jr.

SynOptics Communications, Inc. and StrataCom, Inc. have disclosed plans to develop technology that will let users integrate legacy and Asynchronous Transfer Mode (ATM) LANs over their wide-area networks (WAN).

Out of the gate, SynOptics and StrataCom will work to establish interoperability between SynOptics' LattisCell workgroup switch and StrataCom's BPX backbone ATM switch. Both switches will also gain support for switched virtual circuit-based networking, which will allow users to establish ATM connectivity between any two nodes on the network and automatically reconfigure networks from a central site.

ATM hurdles

Price is a big issue for companies unsure of migrating to ATM

What would accelerate your ATM plans?

Lower costs	58%
More standards	36%
Application/business need	33%
Increased market maturity	18%
Other	12%

BASE: 33 FORTUNE 1,000 COMPANIES (MULTIPLE RESPONSES ALLOWED)

Source: Forrester Research, Inc., Cambridge, Mass.

The companies plan to demonstrate a LAN-to-WAN switched ATM network at Interop '94 next month.

Analysts and users called the partnership a major step toward developing enterprise-switched ATM networks in lieu of a standard from the ATM Forum.

"This partnership fills what has been a big gap in terms of how to establish end-to-end ATM connections over the wide area," said John Boyd, chief networking technologist at Northeast Utilities in Berlin, Conn., which uses switches from both vendors. "If you select this team, you can hold the two companies accountable for interoperability in the short term, while standards will protect you in the long term," he said.

Paul Callahan, an analyst at Forrester Research, Inc. in Cambridge, Mass., said the duo's efforts may help speed up the standards process, which is a barrier to widespread ATM adoption (see chart). The ATM Forum is currently working on a standard for WAN/LAN switched connections, but it will be at least a year until a draft specification is available for developers, observers said.

StrataCom and SynOptics will also do the following by the first quarter of next year:

- Develop frame-relay and T1/E1 interfaces for the LattisCell switch.
- Integrate their proprietary network management systems so users can manage their enterprise networks from one console.
- Integrate common flow control and class-of-service optimization schemes in their switches.

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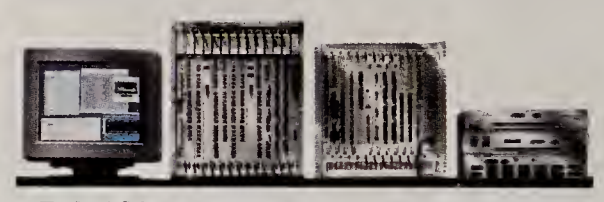

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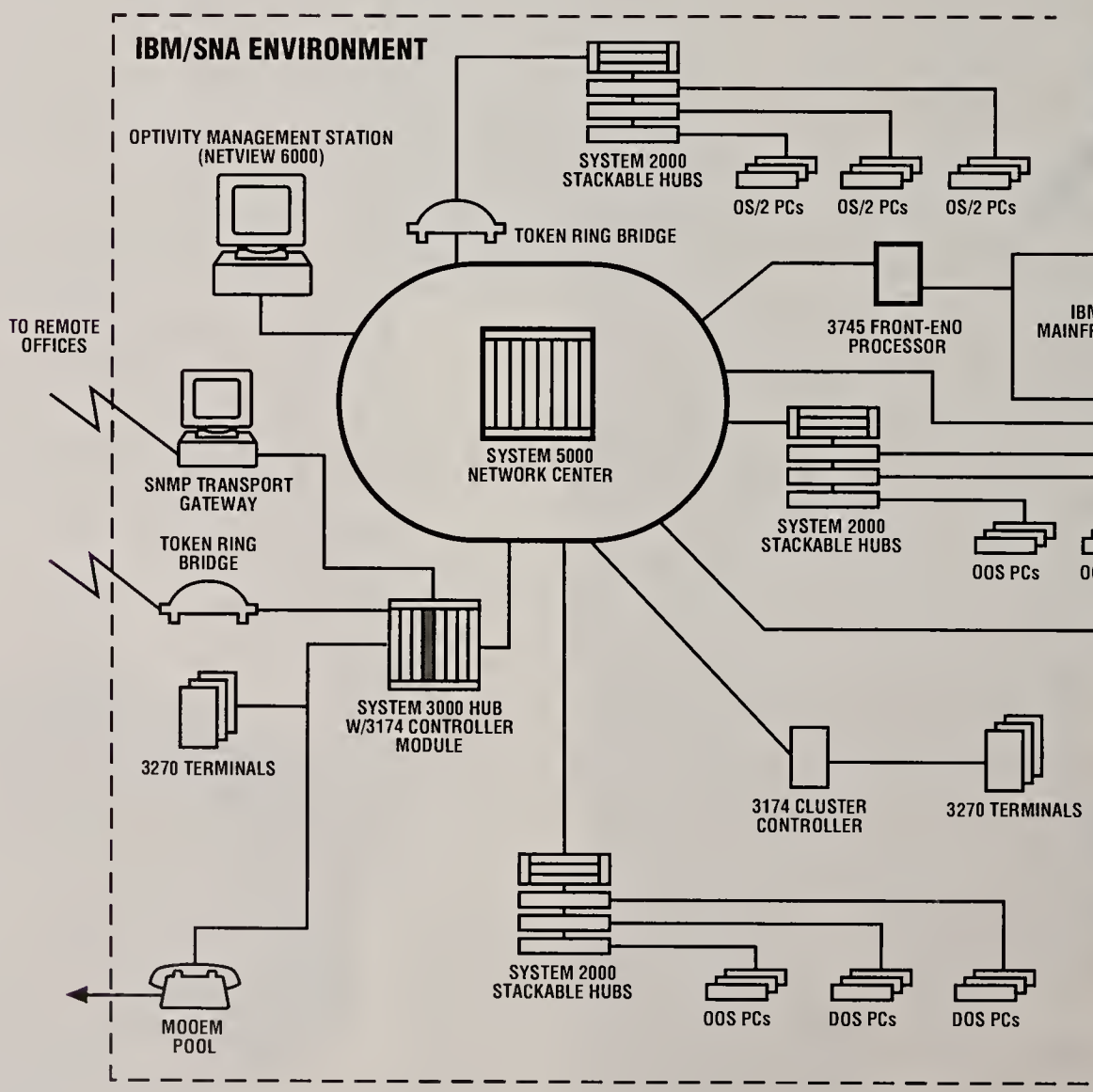

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Internet

CONTINUED FROM PAGE 71

In an electronic-mail message to an IPNG mailing list, a network manager at NASA said, "The transition/coexistence period undoubtedly will last at least a decade and may very well continue for the lifetime of IPNG. It is imperative that the transition support the ability to deploy the IPNG in a piecemeal fashion with no requirement to coordinate local changes with changes elsewhere in the Internet."

Mankin agreed that a credible transition plan is vital and acknowledged that not all users will migrate to IPNG anyway. For example, she said some may find it more expedient to build firewalls between their internal IPV4 internets and the IPNG-based global Internet.

However, she said there are a number of new or improved services that will pull users toward a new IP. These include the ability to support "real-time" services such as multicast transmission and multiple content types; easy and ubiquitous access to the Internet via switched telephone technologies; support for accounting and billing; software-defined networks that allow closed user groups and multiple communities to be served with the appearance of separately provided networks; auto configuration; and policy-based routing.

Future IPs

SIPP, Catnip and TUBA are leading contenders for a next-generation IP that the IETF is considering.

Simple Internet Protocol Plus (SIPP), touted as "a natural increment to IPV4," extends the 32-bit address space to 64 bits by deleting unneeded data in the IP header, thereby supporting more levels of addressing hierarchy and many more addressable nodes. It can be installed as a normal software upgrade in internet devices and is interoperable with the current IPV4.

TUBA, for TCP (Transmission Control Protocol) and UDP (User Datagram Protocol) with Bigger Addresses, replaces IPV4 with the Open Systems Interconnect connectionless network protocol, CLNP. Tuba allows current Internet applications to operate using CLNP as the network layer protocol. It shares most of the architectural features and functionality of IPV4 but uses flexible, variable-length addresses called Network Service Access Points.

The Common Architecture for Next Generation Internet Protocol (Catnip) provides a compressed form of the existing network layer protocols. It integrates CLNP, IP and Internet Packet Exchange (IPX) and allows any of the transport layer protocols in use — for example, TP4, CLTP, TCP, UDP, IPX and SPX — to run over any of the network layer protocol formats.

— Gary H. Anthes

On Capitol Hill

Three major bills, riding the wave of excitement over the information highway, are now moving through Congress.

The bills, which could revamp telecommunications law in the U.S. and obviate much of the debate over what kinds of businesses phone companies can legally engage in, are the following:

- A House bill sponsored by Jack Brooks (D-Texas) and John Dingell (D-Mich.) that would allow Bell companies into long distance and manufacturing.
- A House bill sponsored by Edward Markey (D-Mass.), Jack Fields (R-Texas) and Rick Boucher (D-Va.) that would allow phone companies to provide cable TV.
- A Senate bill sponsored by Ernest Hollings (D-S.C.), Daniel Inouye (D-Hawaii) and John C. Danforth (D-Mo.) that combines elements of both House bills.

— Ellis Booker

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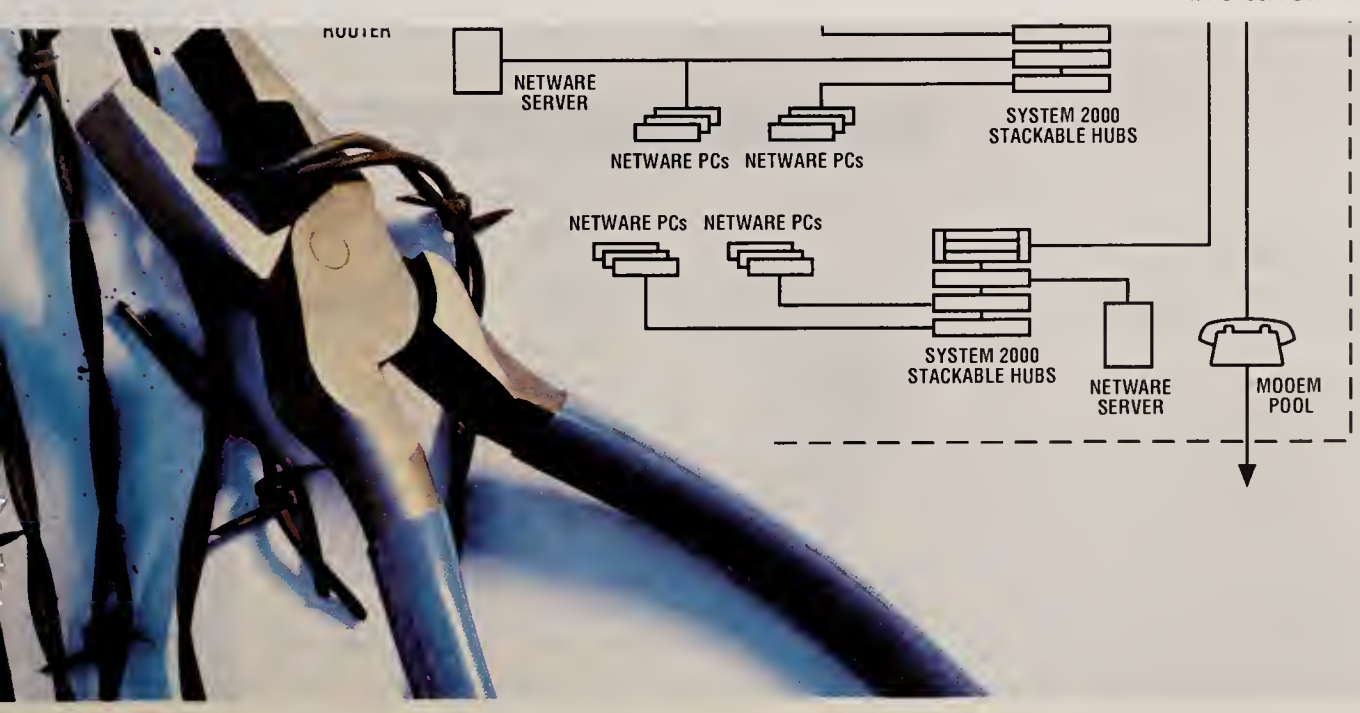


New ISDN products show promise

But high cost of upgrading may limit their appeal

By Ellis Booker

ISDN — for years the butt of jokes and a disappointment to users — is finally poised for real growth, according to two recent reports. But some customers dispute those findings, saying high costs will preclude its adoption for a while.

Last month, The Yankee Group's Communications Planning Service issued a white paper revealing that regional carriers, notably Southwestern Bell and Pacific Bell, are speeding up their Integrated Services Digital Network (ISDN) deployments. Meanwhile, major suppliers such as Intel Corp. and Microsoft Corp. are introducing ISDN-based products or putting the digital public network technology to work in their own operations.

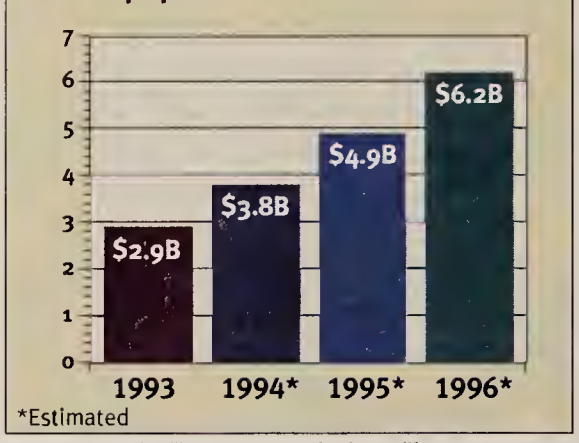
The Yankee Group report predicted that the ISDN market will more than double each year for the next two years and then settle into an annual growth rate of 25% to 50% for three more years.

Concurring view

Also forecasting significant growth is Frost & Sullivan, Inc. in Mountain View, Calif., which says sales of ISDN equipment to be located on customer premises will more than double, from $2.9 billion last year to $8.2 billion in 1997. Leading the overall compound annual growth rate of 28% will be medical and work-at-home end users, who will increase their purchases by 35% and 34%, respectively, the survey revealed.

ISDN booms

The ISDN customer premise equipment market is made up of 11 product categories, including workstations, PBXs and network controllers



Source: Frost and Sullivan, Inc., Mountain View, Calif.

Frost & Sullivan's report asserts that the ISDN market will focus on four major application and technology areas: telecommuting, LAN interconnectivity, multimedia and videoconferencing.

Old problems

However, calls to several telecommunications managers around the country did not reveal a groundswell of interest in ISDN. For many managers, the old problems — the cost of upgrading to compatible private branch exchanges (PBX) and end-user equipment and the cost of carrier services — continue to outweigh the technology's benefits over dedicated and dial-up facilities.

For example, Bob McLean, supervisor of telecommunications at Tower Federal Credit Union in Annapolis Junction, Md., considered an ISDN-based call-accounting package. "We've thought about it, and we've talked to [Bell Atlantic and AT&T] . . . but the benefit wasn't great enough to justify the cost," he said.

Other users said they see some attractive uses of ISDN, even if they are not prepared to pay extra.

"The only use for ISDN that might get me interested is video teleconferencing," said Reuben Sherman, a senior telecommunications analyst at National Life Insurance Co. of Vermont in Montpelier. Frost & Sullivan predicted the market for ISDN-based video systems will grow eight times over four years — from $165 million in 1993 to $1.3 billion in 1997.

Sherman uses five channels on a T1 line from the home office to connect, via 56K bit/sec. multidrop leased lines, to eight of the insurance company's largest remote offices. The remaining 40 or so smaller offices and field agents use 10 dial-in lines to reach the company's mainframe.

In fact, ISDN's biggest potential may be for the work-at-home market, not corporate settings, said Steven A. Taylor, president of Distributed Networking Associates, a consultancy in Greensboro, N.C.

"An ISDN Basic Rate Interface, at 64K bit/sec. to 128K bit/sec., may not be fast enough for a corporate infrastructure if you're talking about LAN internetworking," Taylor said, noting that ISDN was developed for a "host-centric" computing model. "Remember, to send one megabyte of information — say, one Super VGA screen worth of data — we're talking about two minutes at 64K bit/sec."

Limited features

Even work-at-home and ISDN-based videoconferencing are limited by what Taylor calls ISDN's "still spotty" availability.

But it seems clear that carriers, after taking years of abuse over ISDN, are once again pushing the switched digital technology.

"The carriers are calling us all the time," observed Terri Frost, telecommunications manager at A. W. Chesterton Co., a maker of maintenance products in Stoneham, Mass. But while Chesterton might like ISDN as a way for its sales department to use automatic number identification, the company has not decided whether it should upgrade its PBX to support it.

In fact, The Yankee Group report enthusiastically noted that Pac Bell had committed to installing four Basic Rate Interface ISDN lines into each of 7,400 public schools and libraries. This would "seed" the market for additional users.

"[For] every line that Pac Bell installs for free, it will get five subsequent orders from fee-paying customers," the report said. These added lines will come from private schools, pioneering students and multiline homes, the report said.

School district goes wireless to link remote schools

By Stephen P. Klett Jr.

California's Desert Sands Unified School District wanted to standardize on a cutting-edge educational application but could not afford to connect its remote sites via traditional T1 or fiber-optic lines. So it turned to an old, familiar technology for its campus connection: microwave radio.

The district has installed seven wireless Ethernet LAN links from Microwave Bypass Systems in Braintree, Mass., and expects to install 15 more by June to connect its 19 remote school sites over a 10-mile radius with its centralized administrative office in Indio, Calif. These links consist of Microwave Bypass' Etherwave LAN Radio, Etherwave Transceiver and LAN-Link 1000 bridge, which provide wireless point-to-point links for roughly $30,000 per connection.

This will cost the district more than $500,000 — a hefty figure considering it has a 10-year information systems budget of $5 million. However, the district estimates the microwave network will cost roughly one-tenth the cost of a fiber-based network and one-third the amount of leased lines, according to Glenn King, computer systems specialist.

Desert Sands' campus network lets each school in the district access the same Unix-based administrative and financial application to perform myriad applications. These include tracking student registration and demographics, attendance, scheduling and grading, purchasing, accounts payable and warehouse information.

The LAN radio can span single hop distances of up to 15 miles at full 10M bit/sec. speeds, and greater distances can be achieved through the use of repeaters, according to Microwave Bypass. Alternative wireless technologies, such as spread spectrum and infrared, are typically limited to distances of 4.3 miles and data transmission rates of roughly 2.5M bit/sec.

"It works real slick — we're getting full Ethernet speeds out of it," King said. "It actually performs better than our existing Ethernet networks."

Microwave benefits

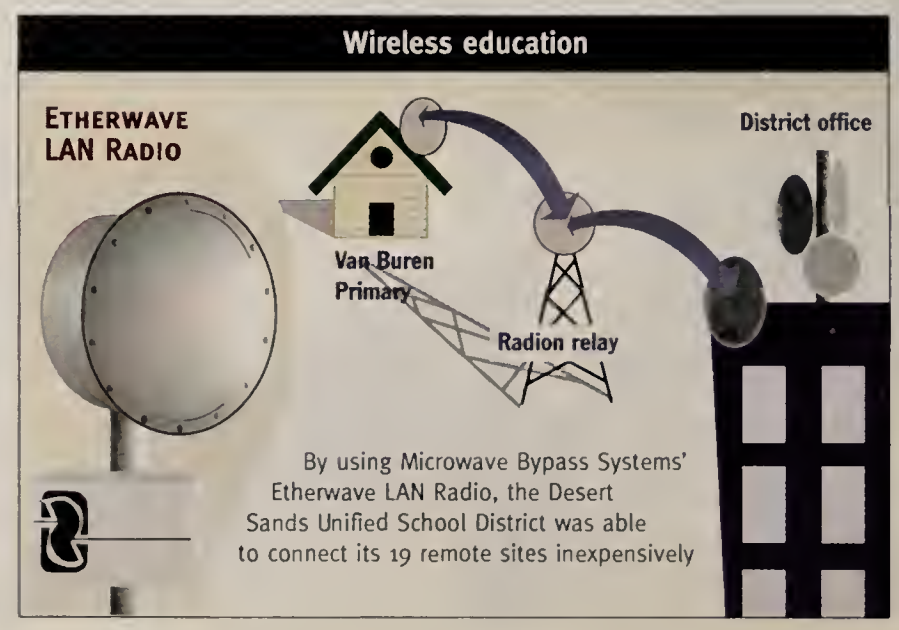
Microwave Bypass' system is also scalable. For example, the company recently announced a full-duplex bridge, the LAN-Link 1000D, that supports bidirectional 10M bit/sec. Ethernet data transmissions between sites for an aggregate bandwidth of 20M bit/sec.

Well-known in radio circles, microwave technology was initially developed for the military and has been applied to campus networking applications only in the last 10 years or so. While it has a standards and familiarity advantage over competing wireless technologies, it is by no means a household name to network administrators.

Microwave's drawbacks, when compared with infrared and spread spectrum, fall mainly in the area of security. Because it uses standard radio frequencies for data transmission, microwave is more susceptible to "eavesdropping" than its competitors.

Douglas Gold, vice president of strategic development at Microwave Bypass, acknowledged this shortcoming. "We recommend that our customers use encryption, but for most, security isn't a chief concern," he said. However, he added that Microwave Bypass does have several government sites, including NASA and Edwards Air Force Base.

Wireless education



By using Microwave Bypass Systems' Etherwave LAN Radio, the Desert Sands Unified School District was able to connect its 19 remote sites inexpensively

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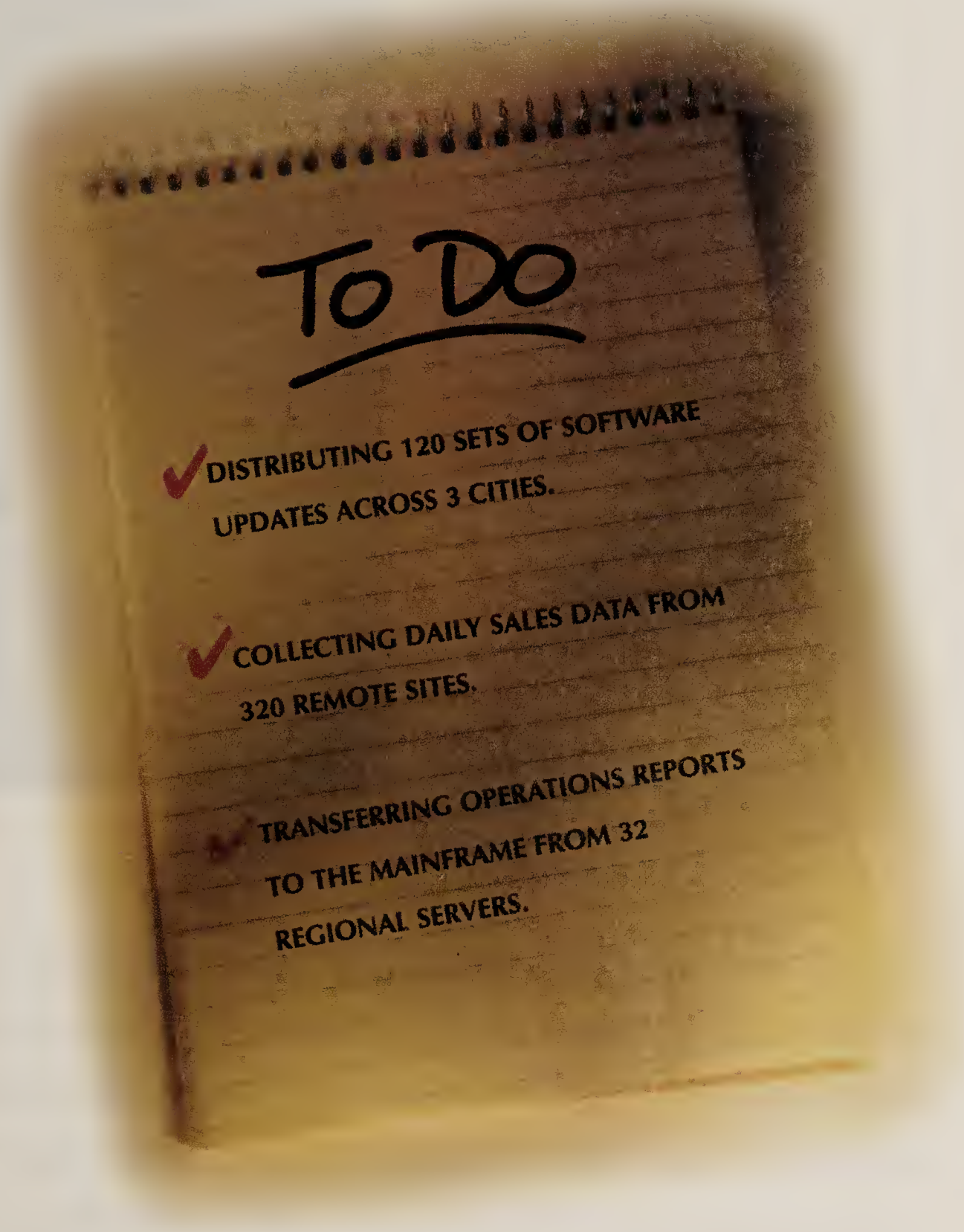

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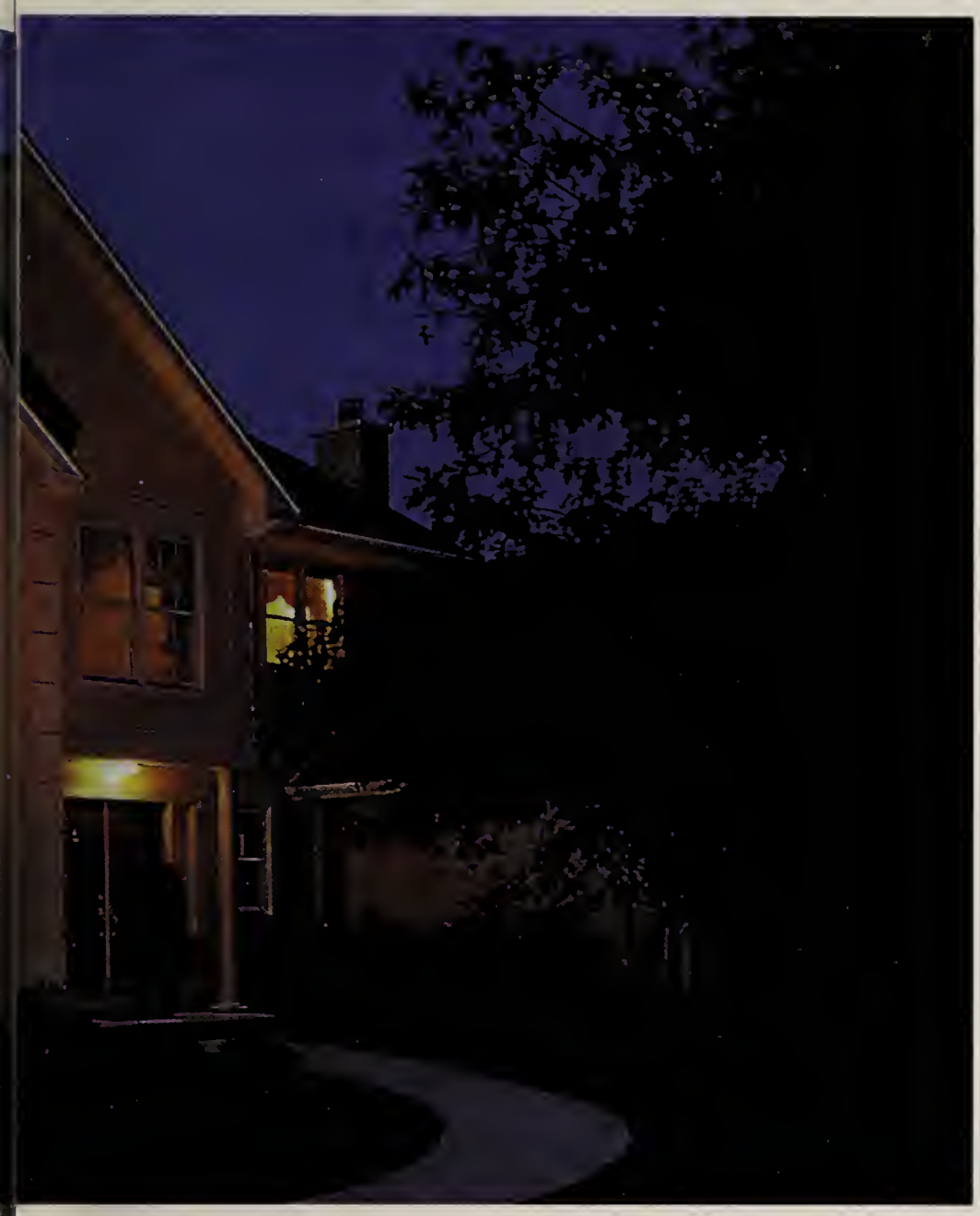

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Briefs

MCI signs $43M pact

Baxter International has signed a three-year, $43 million agreement with **MCI Communications Corp.**, extending MCI's role as Baxter's primary voice carrier. Baxter will use Vnet, MCI's virtual network product, as well as the newer Vnet VNC, which connects international locations to U.S. offices. MCI will also provide Baxter's international private lines and 800 services.

Router manager debuts

Retix in Santa Monica, Calif., has announced a graphical Simple Network Management Protocol (SNMP)-based router management tool called RetixVision for its line of high-end routers. The software is compatible with leading Unix-based network management packages, including **Sun Microsystems, Inc.**'s SunNet Manager, **Hewlett-Packard Co.**'s HP OpenView and IBM's NetView/6000. The software lets users implement either a centralized or distributed management scheme to collect data from remote sites. Pricing starts at $6,000.

Wellfleet routers picked

Wellfleet Communications, Inc. in Billerica, Mass., will supply backbone routers to Florida's Department of Insurance for its statewide frame-relay network. The routers will support a new client/server network for more than 1,300 government users.

PacBell goes CD-ROM

Pacific Bell Information Services in San Francisco has launched a CD-ROM-based catalog, magazine and purchasing system for the network hardware, software and services it sells. The first issue of the publication, *Re:Source Network Solutions*, covers more than 850 Apple Computer, Inc. products; subsequent systems will cover DOS and Windows products. Future versions of the guide will be available on-line by year's end, the Pacific Bell unit said. The on-line system will include transaction capabilities.

NetView/6000 support expands

IBM extended the management capabilities of its NetView/6000 distributed network management platform with Systems Monitor for **AT&T Global Information Solutions** and **Sun Microsystems Computer Corp.** environments. The software can be used to monitor and manage a user-defined set of SNMP devices such as those on a local segment, which frees the network management platform to manage larger, more complex networks. Pricing for the two versions starts at $950 and $120, respectively.

Microsoft and messaging

Microsoft Corp. has rallied important players in the messaging world into an advisory council to help it choose which standards and vendors to support. Members include **AT&T**, **MCI**, **Isocor** and **Collabra Software, Inc.** The group will first meet this month at the Electronic Messaging Association conference.

Cabletron offers hub module

Cabletron Systems, Inc. announced a port assignment module for its Multi Media Access Center (MMAC) line of intelligent hubs. The module was designed to maximize bandwidth use by allowing users to be grouped based on network activities such as file sharing. The module is available in 10-, 13-, 22- and 24-port versions at prices starting at $3,995. Cabletron also announced that **Cisco Systems, Inc.** will provide routing components for its MMAC-Plus high-end hub family announced last month.

Remote access

Connecting branches

Plethora of routers for off-site offices targets price, management

By Stephen P. Klett Jr.

The remote-access steamroller continues to gain momentum with several vendors announcing routers geared specifically for the branch office.

While users may feel overwhelmed by the blitz of produets available, they can at least be comforted by the faet that vendors are paying more attention to their cries for lower prices and more manageability [CW, April 11].

Wellfleet Communications, Inc., CrossComm Corp. and Retix are among those companies that have released low-end routers in the last month (see chart).

Hewlett-Packard Co. is slated to throw its hat into the ring this week with new management software and price euts of up to 20% for its AdvanceStack branch office routers. The line now starts at $2,395.

"We're definitely foeused on reducing users' eost of ownership," said Brice L. Clark, strategie planning manager at HP's Roseville Networks Division in Roseville, Calif.

Money savers

HP is definitely not alone in this bent, and most companies are incorporating potential cost-reducing features such as automatic configuration software, data compression, Integrated Services Digital Network (ISDN) support, multiple WAN ports with dial-up backup connections and various levels of hardware integration.

"The cost of the equipment has come down to a manageable level for users. Now vendors are focusing on the cost of installation and operation on a month-to-month basis," said Michael Howard, president of Infonetics Researeh, Inc. in San Jose, Calif.

Both HP and Wellfleet, for example, offer automatic installation and eonfiguration software for their remote routers. These are aimed at eliminating the need for trained personnel at branch offices.

HP's package provides a feature the company calls "easy-on" that lets users simply plug the router in and "forget about it," Clark said. The software automatically connects the router with the central site and downloads all relevant configuration information and "is ready to run in five minutes," he said.

HP has also updated its Embedded Advanced Sampling Environment (EASE) LAN traffic monitoring software to support wide-area networks. EASE was designed to help users pinpoint underused leased lines as well as define areas of congestion.

Router rumble

On paper, it's becoming harder for users to differentiate low-end routers

Vendor	Wellfleet	CrossComm	Retix
Product	Access Node	XL10	7260
Ports	2 LAN 2 WAN	1 LAN 3 WAN	3 LAN or WAN
Compression	Yes	Yes	Yes
Protocol bundling	No	Yes	No
Starting price	$3,795	$5,995	$5,195
Available	June	Now	Now

And this focus could not come at a better time, observers said.

Infonetics recently surveyed 100 companies with "two to hundreds" of branch offices about their remote LAN interconnect plans, Howard said. Last year the companies had an average of 40% of all their offices connected and planned to have 63% connected this year. By 1997, the companies said they plan to have 94% of all their offices connected.

Worldwide U.S. vendor revenue in the low-end router market is expected to grow from $368 million last year to more than $1 billion by 1997, according to market research firm The Yankee Group in Boston.

Buyer beware

Another emerging trend in the branch office market is that vendors are starting to offer multiple-protoeol support options, which Cisco began with its 2500 line in January and CrossComm now offers. While bundling is beneficial to end users because they pay for only what they need, analysts cautioned them to be wary of extremely low entry-level prices, such as sub-$1,000 routers.

"It's beeoming a lot like buying a car that's under $10,000," said Michael Zsoray, a program director at Gartner Group, Inc. in Stamford, Conn. "It's a great price, but if you want tires and an engine it's another $5,000," he said. "Bundling is a good idea but a $1,000 router without software is nothing."

Vendors are also focusing on integration. For example, CrossComm's XL IBM box, which was announced last week, consolidates router, hub, data service unit/channel service unit, compression unit, SDLC-LLC converter and remote monitoring agent/probe into one system. Retix offers a hub card for its router, and Hypercom, Inc. is expected to announce similar capabilities this week.

However, for the moment "CrossComm is physically more integrated than anyone else, which is very important because space is at a premium in the remote office," Zsoray said.

Second try

For some companies, their latest low-end rollouts represent their second attempt to capture users' hearts, minds and wallets. Cisco's 2500 line for example followed the rollout of its 2000 line — its first low-end offering — by a mere six months.

Wellfleet's Access Node, announced last week, replaces its Access Feeder Node line of low-end routers. The Access Node line offers more management capabilities for roughly half the price.

"With the Access Node, Wellfleet is essentially doing the same thing it's always done only at a much better price, which is always niee," said Rob Drye, a network administrator at a hospital in New Hampshire that is beta-testing the router. Drye also liked the increased manageability of the box. "We can now make changes on the fly, which we couldn't do before."

Logistical nightmare

However, Drye was not interested in ISDN capabilities — an option both Wellfleet and CrossComm offer — simply because of logistics.

"A lot of things being hyped up by vendors are of marginal value to people like us that are out in the boonies, whieh is where remote sites often are," he said. "Yeah, ISDN support is cool, but we have limited potential for ISDN access."

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With the new IEF™ for Client/Server they wouldn't have to just sing solo.

As revolutionary for information systems as notes were for music.

The new IEF for Client/Server is as revolutionary for information systems as notes were for music. Just as sheet music provided Caruso with the same notes that are sung by Etta James, this new integrated development tool provides the structure necessary for different client/server applications to work in harmony.

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HP pursues network storage market

New division will focus on storage purchase options

By Mary Brandel

Hewlett-Packard Co. made its foray into the network storage market last week with the formation of its Storage Systems Division.

HP formed the division by merging its Greeley, Colo., optical storage unit and its disk group based in Boise, Idaho. Its general mission, HP said, is to help administrators in medium-size and large companies sort through, purchase and manage the barrage of storage hardware and software for mixed LAN environments.

To that end, the 700- to 800-person HP division will tailor primary, secondary and archival storage systems using disk, optical and tape hardware as well as utilities and diagnostic tools, HP said.

HP was not the only company to announce network storage intentions. Memorex Telex N.V. has made a similar move (see story at right).

Today's average storage capacity on the LAN is 7.2G bytes per server, according to Peripheral Strategies in Santa Barbara, Calif. That is expected to increase to 41G bytes in 1997.

Software on the way

The group announced an expandable PC LAN disk array product and a low-end optical jukebox this week, but storage management software will not be available until sometime "before the end of the year," an HP spokesman said. Such software will include backup/archival, document management, image-enablement and hierarchical storage management.

Software is "an integral part of what they're doing," said Michael Petersen, an analyst at Peripheral Strategies in Santa Barbara, Calif. Because the division is still "hardware-focused," he said, "it will take time to evolve this."

Seizing the opportunity

Analysts see the merger as both a rationalization of HP's existing storage products and a needed reorganization of competing business units that could work to HP's advantage. "HP as a company has an intrinsic opportunity that more specialized companies don't," including other network storage contenders such as Conner Peripherals, Inc. and Cheyenne Software, Inc., said Jim Porter, an analyst at Disk/Trend in Mountain View, Calif.

The two announced products — the disk array and the optical jukebox — were essentially tweaks to HP's existing product line.

With the HP Disk System and Disk Array — the first major enhancement to HP's LAN-based redundant arrays of inexpensive disks (RAID) line, according to an HP spokesman — users can expand their storage capacity or add fault tolerance on an as-needed basis.

A starter cabinet with 0.5G-byte drives can be mixed and matched with more drives, digital audiotape, software or hardware-based RAID and additional cabinets. The system is expandable to 80G bytes and four cabinets per server, and pricing starts at $3,019. The system is compatible with major PC and network operating systems.

The modular approach reflects efforts by other vendors in the RAID arena, such as Digital Equipment Corp. with its StorageWorks RAID line, Porter said. Modularity is important because "the network administrator in a Fortune 500 firm wants to know, 'If I add this or this, does it plug in easily and will I have to throw away the core [of my storage system] to add to it?' "

The Model 20XT optical jukebox is a lighter, less expensive version of the Model 20LT. The breakthrough on this low-end, 20G-byte system is price, which HP dropped by $3,000 to $6,995.

"The [low] price would make it more affordable to get into the technology," said Jim Toomey, vice president and chief information officer at Loyal American Life Insurance in Mobile, Ala. "When we bought our [first] jukebox, we had to make a sizable investment. But this sounds like I could get 60G bytes for $9,000."

Toomey said he hopes that HP enables him to daisy-chain his larger HP jukebox with this smaller system when it comes time for him to add capacity.

Memorex Telex to offer array of storage, backup products

Memorex Telex N.V. recently announced its intention to become a full-source provider of network storage and backup systems that will extend across a variety of host and client/server platforms. These systems will include other vendors' products when necessary.

Full-service system

The Irving, Texas, company also announced, as part of its Enterprise Network Storage Strategy introduction, a combination of hardware, software and service for enterprisewide LAN backup.

The system consists of the following:

- Memorex Telex's 9400 Enterprise Communications family of channel-attached and remote hardware platforms that support Novell, Inc.'s NetWare for SAA. This is Memorex Telex's way of interconnecting the host with various LAN technologies, including Fiber Distributed Data Interface, Token Ring and Ethernet.
- Emprise Technologies' Stage3 Virtual Tape Solution for LANs, a distributed storage management software package that Memorex Telex will sell under a reseller agreement. Stage3 is said to support centralized, mainframe-based storage management as well as local administration of the LAN backup process. It is a combination of an IBM VTAM MVS application and a NetWare Loadable Module.
- Cheyenne Software, Inc.'s ARCserve backup system for NetWare.

Stage3 will be available this month with all members of Memorex Telex's 9400 Enterprise Communications family. List price starts at $23,100 for a channel-attached version.

—Elisabeth Horwitt

CORBA

CONITINUED FROM PAGE 71

automated tools and distributed agents on their partly standards-based, partly proprietary management systems, Dzubeck said. Indeed, host-based systems management vendors, with their experience managing mission-critical applications, are most likely to bring out products to effectively address users' client/server management needs, Dzubeck said. "The issue is not host vs. client/server but the ability to address the enterprise," he said.

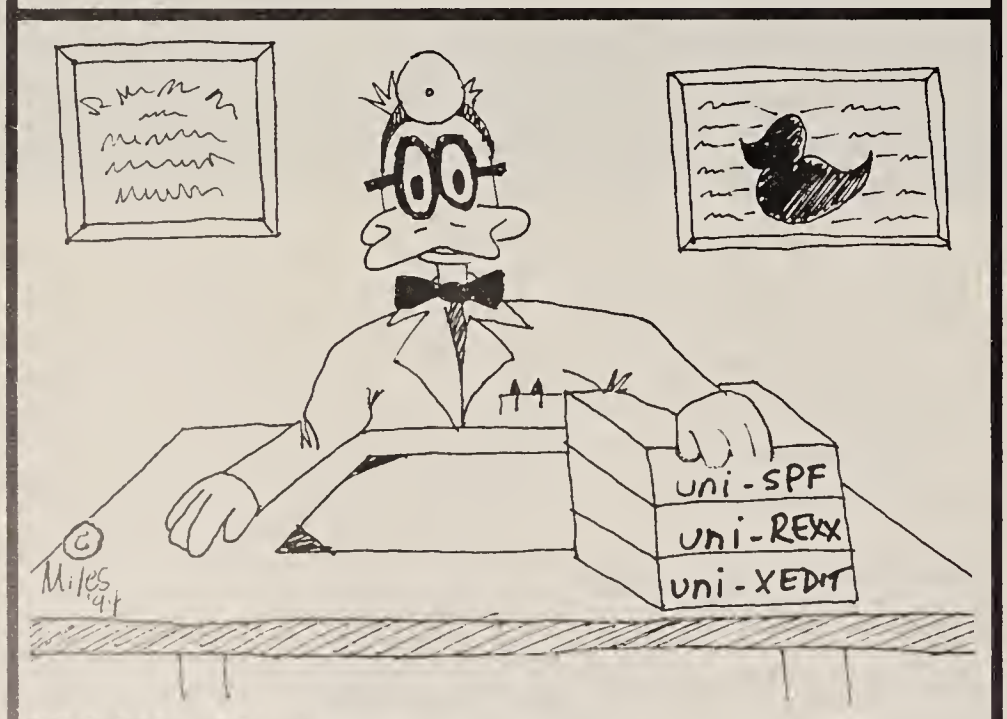
In the meantime, the market for client/server systems management is burgeoning as users realize that some of the features they took for granted on the host are conspicuously absent from their client/server setups. Among these features are backup, problem management, work load management, software distribution and configuration management.

Savings confirmed

Reports of major paybacks are filtering back from corporate implementors of the early systems of this type. United Parcel Service, Inc. for example, found that in the initial two months of using Novell's NetWare Management System (NMS) to manage its client/server installation, it saved $25,000.

The payback came from decreased travel reimbursements and mileage by systems administrators who had to visit each site to solve problems, said Mark Dodge, manager of LAN and PC systems. The package handler expects NMS to pay for itself in 14 months, for each district, he added.

Suffering from a migration headache because of vi and other Unix ailments? Take two of these and call us in the morning.



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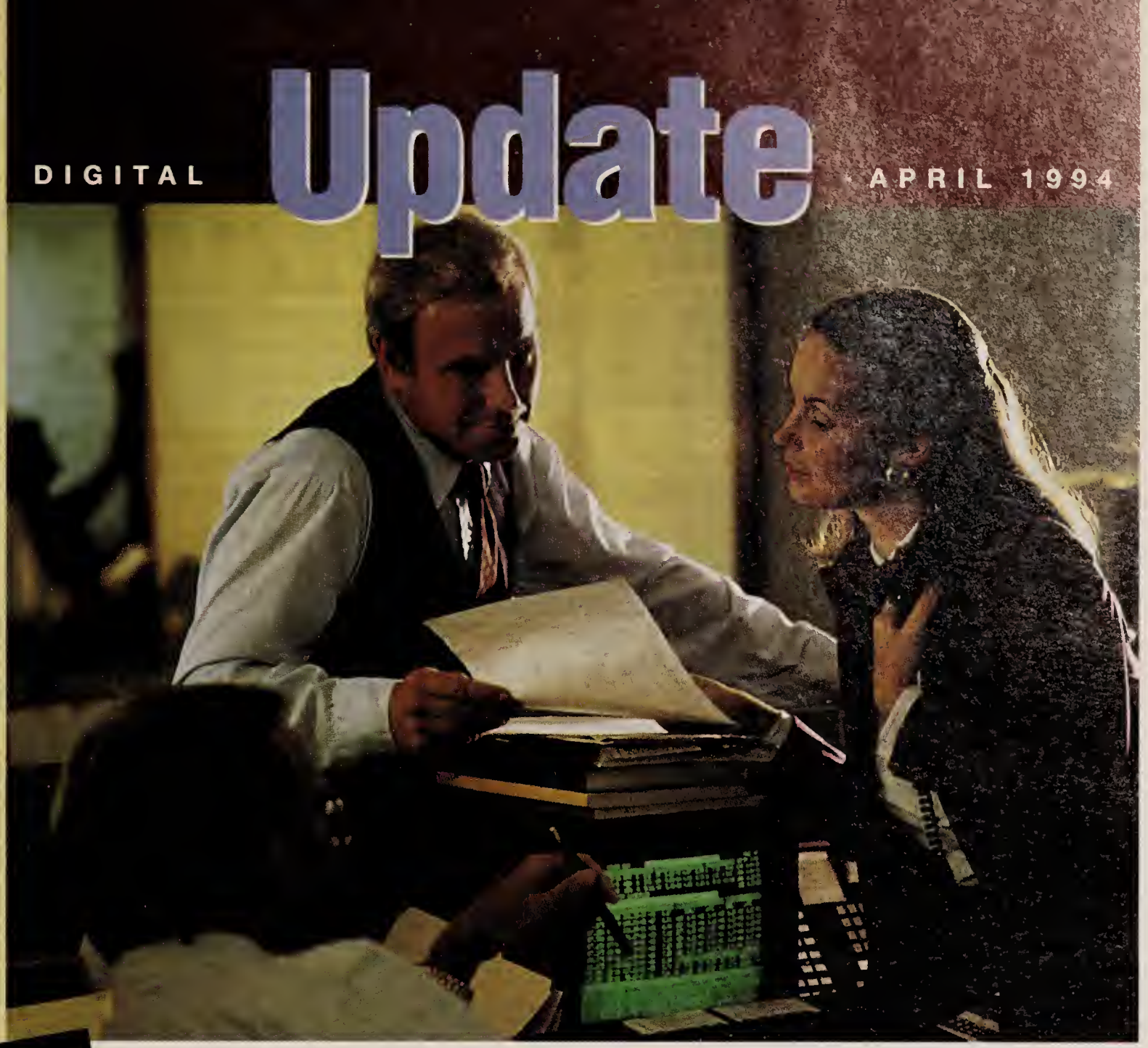


System Upgrades: Two Categories Make It Easy

Workgroup (Lower Category)

VAX Systems*
All VAXstations
All MicroVAX Series
VAX 4000-50/100/100A/200

MIPS Systems
All DECstations
DECsystem 3100/50xx/5100 Series

Alpha AXP Systems
DEC 2000/3000

Departmental/Enterprise (Higher Category)

VAX Systems*
VAX 4000 Models 300-700A
VAX-11/7XX
VAX 6000/7000/8000/9000/10000 and VAXft

MIPS Systems
DECsystems 5200–5900

Alpha AXP Systems
DEC 4000/7000/10000

*Also includes VAXserver systems with the same product numbering schemes.

Special pricing on software license upgrades applies only to software licenses ordered at the time of the system upgrade purchase. Media and Documentation kits are not included with the program and must be ordered separately.

For information on Digital's ADVANTAGE-UPGRADE program and our special software upgrade offer,
CALL 1-800 DIGITAL
(1-800-344-4825) and reference BYN.

SAVE Big Money on Software

Take Advantage of Digital's ADVANTAGE-UPGRADE Program

Let Digital help you eliminate the cost of upgrading your software when you upgrade your system. When you move to new Alpha AXP or Alpha-ready VAX systems via our ADVANTAGE-UPGRADE program, you can upgrade your software at virtually no cost, or 100 percent trade-in credit.

That's right. If you order and take delivery by July 2, 1994, you can upgrade your software for FREE or for 100 percent trade-in credit toward a new license upgrade. This means that you can literally save your business thousands of dollars.

Why have we introduced this software upgrade offer? Because we know that software upgrade costs may have prevented you from upgrading in the past — and that your budgets are even more constrained these days. And we've made it so easy. For this program, all existing systems are placed in two categories — Workgroup and Departmental/Enterprise (see story this page). Want more details? Read on to learn about all the features of Digital's software upgrade offer.

There is no charge for license upgrades when moving within either category or from a system in the Departmental/Enterprise category to one in the Workgroup category.

When moving from the Workgroup category to the Departmental/Enterprise category, the cost of the license upgrade is significantly reduced because you get 100 percent trade-in credit for your existing license.

This offer applies to OpenVMS, DEC OSF/1, or ULTRIX operating systems; VAX, MIPS, and Alpha AXP platforms; all ADVANTAGE-UPGRADE upgrades or Alpha-ready upgrades (in-cabinet board upgrade packages or cabinet upgrades), as well as system trade-ins; and all Digital layered software products, user licenses, and operating systems associated with the above-named platforms.

Don't miss the savings. If you're thinking about moving to a new VAX or Alpha AXP system, take advantage of Digital's ADVANTAGE-UPGRADE program — and our new software upgrade offer. We can help you lower your cost of upgrading, get new technology and a lower cost of ownership, and acquire a higher-performing system to better serve your business requirements.

Upgrade your software for FREE or for 100 percent trade-in credit toward a new license upgrade.

digital™

Digital's ChannelWorks Hardware

Providing Community-wide Ethernets and Low-Cost Internet Access

Just imagine a group of people working on a collaborative project — sharing documents, pictures, and graphics; trading video clips; and jotting down ideas on shared notebooks. Now imagine that the individuals in this group are working interactively from their computers from different locations. And not just in separate buildings or across campus, but across town or across the city.

The major benefit of this scenario? Schools, businesses, healthcare facilities, and municipal governments can save time and money by sharing information at real-time speeds and across multiple sites. And, they can run applications such as telecollaboration, distance learning, telemedicine, the World Wide Web, electronic data interchange (EDI), and geographic information systems (GIS).

ChannelWorks Hardware Makes It Happen

Any user who has the need for Ethernet-speed networking across a community will benefit from Digital's ChannelWorks hardware. The leading product on the market today for Ethernet via cable television, the ChannelWorks solution enables client/server networking across a community.

ChannelWorks hardware provides 10 Mbits/s connectivity of Ethernet local area networks (LANs) across a community over an existing commercial cable television network. With a ChannelWorks bridge at each LAN site, and one TransMaster translator at the cable company headend, a community-wide Ethernet is created, enabling users at different companies and locations to communicate with each other as if they were in the same building working on their local Ethernet LAN. Ultimately, this capability saves you time, increases your productivity, and offers lower-cost Internet access by saving your business money on dedicated leased lines for each building.

How Does It Work?

Digital's ChannelWorks hardware uses UNIlink, a unique protocol designed to run over commercial cable television for a distance of up to 70 miles. UNIlink encapsulates Ethernet data that is sent over the cable channel. ChannelWorks uses one forward and one reverse cable TV channel, and can run right alongside HBO or The Movie Channel. In fact, it can run over a total of 83 channels — but to the user, it appears just like a standard Ethernet LAN.

What's more, multiple customers can share the same channel without having to worry about information security. User groups, configured via SNMP, create separate logical networks. You can have separate user groups — one for schools, one for hospitals, and one for businesses doing collaborative engineering, for example.

Creating an Information Highway On-Ramp

Digital has been working with the cable television industry for the past three years to provide innovative products and services for this industry and its customers. ChannelWorks is just one of the products designed to bring the Information Highway to you — today.

In addition, we offer a total networking solution through our Digital Channel portfolio. This portfolio includes Ethernet, FDDI, and ATM networking products; high-speed Alpha AXP PCs, workstations, and servers; and a full range of consulting, installation, integration, and management services.

For information on ChannelWorks hardware or the Digital Channel,

CALL 1-800 DIGITAL

(1-800-344-4825) and reference BYP.

Attention ALL-IN-1 IOS Users

FREE TeamLinks Client Software

You can start implementing client/server computing today with your free copy of TeamLinks Mail for Windows software — plus free service calls, if needed. DEC MAILworks users can take advantage of this offer, too.

The offer is good for one copy of TeamLinks Mail for Windows client software per customer name for each ALL-IN-1 or DEC MAILworks site while supplies last. TeamLinks Mail is easy to install, but should the need arise, you can call our customer service center for free assistance.

TeamLinks Mail acts as a "client" to your ALL-IN-1 IOS V3.0 "server," so your current video terminal users who create mail with their ALL-IN-1 system can exchange mail with TeamLinks Mail users on PCs with Windows. By implementing this client/server solution, you'll receive seamless electronic mail service as well as electronic filing no matter how many networks, types of PCs, and applications your business uses.

In order to take full advantage of your ALL-IN-1 V3.0 software as your TeamLinks Mail server, you simply need to upgrade to ALL-IN-1 V3.0-A.

Investment Protection and Client/Server Productivity

There's a host of reasons to begin client/server computing now with Digital's TeamLinks Mail software. Investment protection is just one of the benefits. With TeamLinks software, your existing ALL-IN-1 IOS system investment is protected. In fact, TeamLinks is the only software that provides the same services to video terminal, Windows, and Macintosh users alike — protecting your investment in desktop devices while you evolve to client/server computing.

Just imagine — you don't have to give up anything to use TeamLinks Mail. It integrates and enhances today's most popular software products, including Microsoft Word for Windows, Excel, WordPerfect, Lotus 1-2-3 for Windows, Ami Pro, Calendar Manager, Network Scheduler 3, and other Windows-compliant applications. What's more, Digital is committed to ship TeamLinks for ALL-IN-1 on the Alpha AXP platform by this summer. That means even better price/performance and enhanced X.400 mail capabilities for your business.

To receive your FREE TeamLinks Mail for Windows client and FREE support calls, call

1-800-457-8211

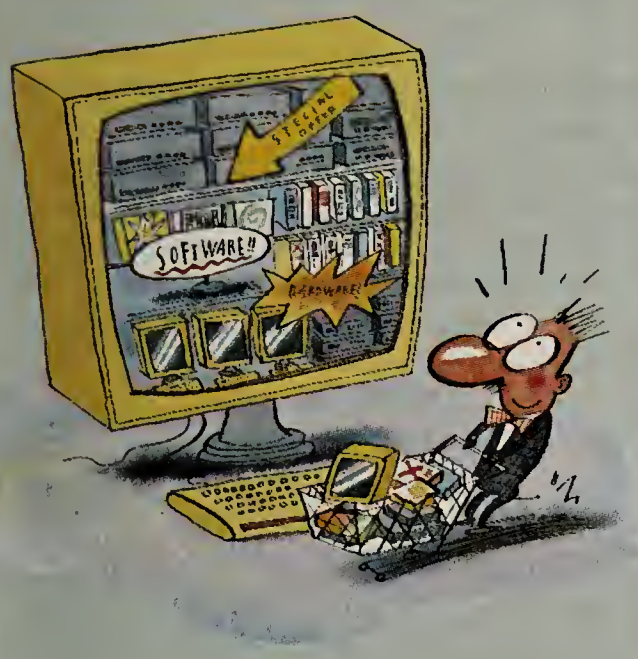
and reference BWE.

"This announcement of now being able to use TeamLinks software as a client to an ALL-IN-1 server is a major milestone."

Martyn Kenyon, Office Systems Manager, British Gas

Electronic Shopping That's Free and Easy

The Electronic Connection is a free on-line information and purchasing service that provides you with immediate access to and the convenience of electronic shopping for Digital's services and hardware and software products. This no-obligation service enables you to evaluate, select, configure, quote, and purchase products on-line, as well as obtain information about product announcements, news, and special offers from Digital.



Updated daily, the Electronic Connection puts information on Digital and complementary solutions and services at your fingertips through product descriptions, selection charts, prices, and configuration aids. And it's simple to use. The information is organized in an easy-to-use system of menus. Rapid search methods, such as keywords and order numbers, are also available.

Save Time and Money

The Electronic Connection can save you time and money because orders are placed on-line. Critical ordering information such as order number, product availability, and pricing can be displayed for a given product. Once the order is placed, it is immediately entered into Digital's order-processing system, allowing you to monitor your order.

There are three ways to apply for an account and access the Electronic Connection. They include:

- Internet
  Telnet Orders.Sales.Digital.Com
  (IP # 192.208.36.2)
- Modem
  1-800-234-1998
  (1200–9600 Baud, 8 Bits, No Parity)
- TYMNET
  Log in to ECONN (Host # 14507)

Electronic Connection hours let you shop when it's most convenient for you. The system is available 7 days a week from 7 A.M. until midnight (U.S. EST).

It's Your Call. Why Not Make the Most of It?

Doing business by telephone is the main focus of the call center environment. Many organizations utilize call centers to generate revenue, improve customer service, and facilitate communications. But the telephone is only part of the story.

The typical call center makes use of products and services from several different sources, including:

- Public and private telephone network services
- Voice switches and Automatic Call Distributors (ACDs) from Telephone Equipment Manufacturers (TEMs)
- A variety of hardware and software
- Specialized business applications
- Fax machines
- Components such as voice response units, voicemail systems, call sequencers, and predictive dialers.

Making all this disparate equipment work together may prove challenging. In fact, in many traditional call centers today, the telephone and computer systems remain separate and unconnected entities.

The result? Data can't be passed back and forth among individual call center components. Information such as voice, text, statistics, and images can't be merged in the same databases or used by the same applications. Desktop telephone and terminal functions aren't coordinated or integrated to produce maximum productivity.

CallCenterPLUS Puts It All Together

Digital's CallCenterPLUS family of products and services is an innovative, uniquely inclusive approach that brings the telephone network, voice switches and ACDs, computer equipment, and software applications together in a comprehensive, cost-effective call center solution.

With this product, Digital has successfully incorporated a host of emerging technologies to merge voice and data information into mainstream business applications — applications that use information provided by the telephone system or any of the call center's voice components, as well as "back-office" corporate databases. And because each call center has its own requirements, CallCenterPLUS provides an array of robust products and tools from Digital and third-party suppliers for building customized business applications.

A key component is Digital's Computer Integrated Telephony (CIT) platform for integrating computer and telephone systems. Digital also delivers state-of-the-art components such as voice response units, voice messaging systems, and facsimile systems; multivendor networking hardware and software for interconnecting diverse computer systems and applications; and a complete portfolio of systems integration and installation services.

Increased Productivity and Cost Savings

The bottom-line benefits of CallCenterPLUS are clear. This family of products increases productivity by automating functions ranging from placing calls to managing call volume to querying databases, validating transactions, and generating management reports.

In addition, CallCenterPLUS solutions improve efficiency and save time by making information from multiple databases readily available at the desktop. Inbound and outbound calls can be processed more rapidly — ultimately enabling your business to control telephone network charges.

An Eye on Investment Protection

Few companies can justify the purchase of a completely new telephone and computer system in order to implement a next-generation call center solution. And with CallCenterPLUS, they don't have to. Our components are designed for maximum compatibility with existing voice switches, computer hardware, and software applications. In addition, these solutions have the ability to accommodate new telephone and computer system components — as well as emerging voice and data technologies — that you may add in the future.

For more information on Digital's CallCenterPLUS solutions, call
1-800-334-4636
and reference ext. 705.

Integrate your call center's voice and data information today with Digital's CallCenterPLUS solutions.

DIGITAL Update APRIL 1994

Configure Your Sun Storage System in No Time Flat

Make It Happen with Digital's StorageWorks Products

How long is your morning coffee break — ten, maybe fifteen minutes tops? That's about how long it takes to configure your Sun SPARCstation or SPARCcenter Server with Digital's StorageWorks SCSI-2 Expansion System for Sun. What used to be an awkward, time-consuming task can now be done quickly and easily. The design of the StorageWorks family — exceptionally modular, flexible, and expandable products — makes it happen.

Digital's StorageWorks solutions let you change components by simply snapping in devices, fans, SCSI converters, and power supplies without ever having to power down the system. What's more, neither tools nor service calls are required. Imagine having that kind of control, no matter what your needs are. Now, you can.

StorageWorks Products Make Sun Configuration a Snap

	StorageWorks for Sun Deskside Expansion Pedestal	Sun SCSI Expansion Pedestal
Add a device	Snap-in capability for choice of SCSI-2 Disk, Optical and Tape devices, 3.5-inch, 5.25-inch disk drives, and 4 mm and 8 mm tape drives	Service call required Limited media May require new subsystem
Dual power supply	Yes	No
Redundant cooling	Yes	No
Component swap	No powering down	Must power down
Reconfigure potential	Can change devices and device types from one enclosure to another from desktop to data center	Additional equipment is needed to move devices from mid-range to data center

For more information on Digital's family of StorageWorks products for Sun,

CALL 1-800 DIGITAL

(1-800-344-4825) and reference BYG.

Maximize the Return on Your Sun Development Systems

If maximizing the return on your existing Sun hardware and software development tools is important to your business, Digital has the answer you need. Our COHESIONworX solution provides an open distributed software development environment that integrates all your Sun development systems into a flexible client/server model — creating a virtual system on the network.

With the COHESIONworX product, your software engineers have the ability to use integrated tools and access data across UNIX systems — saving time for your developers and saving money for your business. Whether these developers are using SunOS, HP-UX, or Alpha AXP OSF/1 software, the same interface appears on their screen. All the tools your users require, no matter where in the network they reside, are represented as icons right on the graphical "desktop."

Tools You Can Use

Digital's COHESIONworX solution includes an integrated set of graphical programming tools based on familiar UNIX utilities that support development in Ada, C, C++, FORTRAN, and Pascal. New tools can be added easily with no source code changes required — ensuring that your investment will suit your business needs in the future as well as today.

Create your own COHESIONworX environment today at a savings of more than $700. Now you can get a concurrent user license at a price of $1,548. But hurry — this special offer is valid only through June 30, 1994.

For information or a FREE COHESIONworX product trial, call

1-800-344-4825

and reference BYM.

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New Products

3Com Corp. has announced updated software features and hardware enhancements for its TokenLink III XT/AT bus adapter.

According to the Santa Clara, Calif., company, features include AutoLink, 3Com's automatic installation and configuration software. The product also offers hardware enhancements such as LEDs to indicate successful insertion into the ring.

The adapters come equipped with 3Com's Transcend SmartAgent software for Simple Network Management Protocol management down to the desktop, allowing the network to be viewed in a graphical, structured way.

3Com's 100% IBM-compatible TokenLink III adapters are priced at $375 for an XT/AT bus 10-pack; $413 for a Micro Channel Architecture 10-pack; and $512 for an Extended Industry Standard Architecture five-pack unit.

▶ *3Com*
(408) 764-5000

American Power Conversion Corp. (APC) has unveiled PowerChute plus for Windows NT and Windows NT Advanced Server.

According to the West Kingston, R.I., company, PowerChute plus offers automatic, unattended shutdown when used with APC's Smart-UPS, Back-UPS or Matrix-UPS, plus full bidirectional, serial communieations when used with APC's Smart-UPS or Matrix-UPS Series.

PowerChute plus offers an unattended system shutdown that warns the user of power problems and automatically shuts down the system before the uninterruptible power supply (UPS) battery is discharged.

PowerChute plus is available for $99.

▶ *American Power Conversion*
(401) 789-5735

StonyBrook Serviees, Ine. has announced Router Manager Version 2.0 for Cisco Systems, Inc. and Wellfleet Communications, Inc. routers.

According to the Bohemia, N.Y., company, the product is a Windows-based "snap-in" application designed for Novell, Inc.'s NetWare Management System (NMS) platform.

Version 2.0 extends the reach of the management platform by providing Simple Network Management Protocol for multiprotocol router internetworks.

Router Manager Version 2.0 eontinuously monitors the status of each router in the network, reporting protocol and interfaee errors. It also provides real-time network utilization statistics.

Version 2.0 offers 17 additional features, including statistics and the ability to write to the NMS database.

Router Manager Version 2.0 costs $1,995.

▶ *StonyBrook Services*
(516) 567-6060

Cayman Systems, Ine. has introduced GatorRoute IR, an integrated and expandable four-port multiprotocol router.

According to the Woburn, Mass., company, the product easily connects workgroups to the Ethernet backbone. GatorRoute IR has two Ethernet ports for full media support and expansion slots for either two serial ports or one serial port and one LocalTalk port.

GatorRoute IR provides simultaneous routing of Novell, Inc.'s IPX, Apple Computer, Inc.'s AppleTalk and Digital Equipment Corp.'s DECnet.

The product can be configured and monitored from any local or remote workstation, PC or Macintosh by using Telnet, Simple Network Management Protocol, an out-of-band serial or GatorKeeper, the company's graphical user interface.

GatorRoute IR costs $3,295.

▶ *Cayman Systems*
(617) 932-1100

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Reach 100,000 top students on top campuses by advertising in Computerworld's annual Campus Edition in October.
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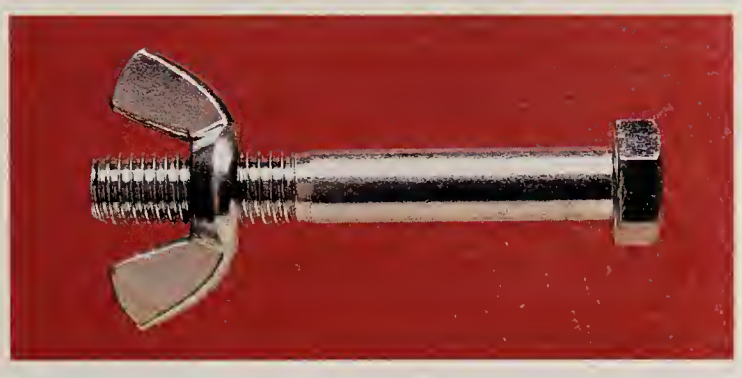

Can you locate the 1990 contracts with all wing nut suppliers who have salesmen named Felix in cities that begin with the letter "T"?

In 3.2 seconds?

Three seconds!? Chances are, you probably couldn't even do that in three *hours*. Who could?

It's not who, but what – MI[3]MS® 3000, our integrated information and image management system.

With this system, you can manage both your documents and your information more efficiently through a single, easy-to-use interface. Therefore, you can work more productively.

The compound document architecture allows you to capture document-based information from a variety of sources—fax, OLE objects, paper, microform and text files.

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Client/server software

Appeal of start-ups is in the support

By Rosemary Cafasso

When the corporate division of United Technologies Corp. went shopping for client/server-based accounting software last year, it bypassed the heavy hitters in the software industry and instead chose a tiny, unknown quantity from Atlanta called SQL Financials, Inc.

United Technologies is hardly a daredevil. Industry observers say more and more users are willing to take a calculated risk with a start-up when it comes to client/server computing. It often comes down to the amount of one-on-one support that a small company can afford to give its customers.

"The larger companies are not necessarily in a position to bring all the resources to the table to support all their new business," said Tony Friscia, an analyst at Advanced Manufacturing Research, Inc. in Boston. "Your comfort level could be higher because of the direct contact you have with a smaller organization."

A deal with protection

Further, users said they can typically work directly with the highest levels of a small company — which often means creating deals that protect them as much as possible.

For example, United Technologies was able to get SQL Financials to put the accounting software code in an escrow account, which ensures they will have access to the code should SQL Financials go belly-up.

The size of SQL Financials "was a key risk as we looked at this whole thing," said Bill Johnston, corporate director of financial systems development at United Technologies. "We satisfied ourselves in a couple of ways. One was talking to senior management, and we heard good answers from them. The other thing we did was work with getting source code in escrow."

Industry analysts also said software start-ups are often launched by former consultants or systems integrators who can provide the level of expertise many users seek.

While bigger companies can also offer the expertise, they do not always provide it as frequently or as easily as a smaller shop, users said.

"Being small is not necessarily a negative," said Michael O'Dea, supervisor of financial systems and Unix administration at the corporate offices of Ameritech Corp. in Chicago, which uses SQL Financials software. "If there are only five or six other customers, it is easier to lean on them. There were times when our users called their developers directly."

Solid base, high marks

Spectrum Associates, Inc. is another little-known software house that is building up a solid customer base. The company was founded as a consultancy in the late 1980s by two former Powersoft Corp. executives. It then purchased Growthpower, host-based manufacturing software that Powersoft wanted to shed as it focused on the software tools market.

More recently, Spectrum shipped a client/server-based manufacturing package to several beta customers, and so far the company is getting high marks from early users.

"I have dealt with these people for six years," said Richard Hoffman, information systems manager at Brookfield Engineering Laboratories, Inc. in Stoughton, Mass., of his relationship with Spectrum. "With a

Start-ups, *page 96*

IBM's parallel mainframes take center stage

Company drops mainframe prices

By Craig Stedman

■ The parallel System/390 systems and revamped MVS software pricing structure that IBM unveiled this month are not enough to put the mainframe line on the same pricing curve as Unix machines, industry analysts said. But IBM appears to have made a pretty good start, they added.

"IBM still has a long way to go overall in making the System/390 competitive" on price, said Robert Schafer, a program director at Meta Group, Inc., a consulting firm in Westport, Conn. "I don't see many users having a nice budget impact this year. I think that's more in 1995."

Schafer noted, however, that the recent announcement was "more important for what it said about the direction where IBM is going than for anything in particular that you can buy today." He credited IBM for getting realistic and moving away from talking about pricing issues only "as a smoke screen."

Nevertheless, direct cost comparisons between the new System/390 Parallel Transaction Server (PTS) and Unix hardware remain somewhat difficult because IBM extended its year-old policy of not publicly disclosing list prices on any of its mainframes to include the parallel systems.

Schafer said he expects the PTS hardware to sell for an average of about $10,000 per MIPS, down significantly from the more than $30,000 per MIPS on traditional ES/9000s. However, Unix machines are generally below the $10,000 per MIPS level, he added.

Two other analysts — Charlie Burns, head of large computer strategies at Gartner Group, Inc. in Stamford, Conn., and Susan Middleton, an analyst at International Data Corp.

Mainframes, *page 93*

New IBM lineup

While the parallel System/390 systems took center stage at IBM's recent mainframe rollout, the company also introduced the following products:

- **ES/9000 Model 9X2**: 10-way traditional mainframe with up to 22% more power than the eight-way Model 982. Available in October.
- **ES/9000 211-based models**: Five air-cooled mainframes based on CMOS microprocessors running 40% faster than previous versions. Available now.
- **MVS/ESA SP Version 5**: New release with support for parallel and coupled systems, work load management and the Distributed Computing Environment and Posix standards. Available June 24.
- **SystemView management software**: New products for managing parallel systems as a single machine and collecting system performance data from MVS/ESA's Workload Manager.
- **Powerparallel SP2**: Unix parallel processor supporting four to 128 Power2 RISC chips. Rated at more than twice the performance per processor as the SP1. Priced from $398,000. Limited shipments start this month.

Aims its query server at big shops

By Thomas Hoffman and Craig Stedman

■ With the introduction of its Parallel Query Server (PQS) earlier this month, IBM has clearly taken the offensive to stem the flow of its DB2 users to competitive Unix-based decision-support systems, particularly AT&T Global Information Solutions' Teradata DBC/1012 database engines.

PQS targets IBM's retailing, banking, health care, airline and insurance industry customers, according to Richard T. Cumings, manager of S/390 product marketing at IBM U.S. Those are the same target markets that AT&T Global Information Solutions, the former NCR Corp., is attacking with its Teradata decision-support system and Unisys Corp. with its DataCentral enterprise servers.

But Cumings argued that PQS is uniquely positioned against those offerings because the IBM server does not require users to learn Unix or migrate data. "There are vast amounts of DB2 data that are underutilized by our customers," Cumings added. PQS "will exploit that without forcing any changes to applications and data."

Analysts said they understood IBM's strategy. "If you're IBM — and you see people front-ending your mainframe — why not put your own front end out there?" asked Ken Ow-Wing, program manager at International Technology Group, a Los Altos, Calif.-based market researcher.

The S/390 PQS was designed to attach to an IBM Escon-ready ES/9000 mainframe or processor running DB2 and MVS/ESA. However, IBM is currently working to provide network connectivity so that PQS does not have to reside on an ES/9000, IBM executives said.

Nicholas M. Donofrio, senior vice president and general

Query, *page 93*

Computer matching nabs double-dippers

Database comparisons to fight welfare fraud in N.Y., N.J.

By Mitch Betts

The battle against welfare fraud took a turn recently as officials in New York City and the states of New York and New Jersey decided to compare their databases to spot "double-dippers" collecting welfare benefits in more than one jurisdiction.

ROBERT DEMICHIELL

Mainframe data tapes will be sent to the New York state data center in Albany, N.Y., where cross-checking will be performed on a Unisys Corp. Univac 2200 mainframe to identify the double-dippers, said Linda Hibbs, assistant director of information systems at the New Jersey Division of Family Development in Trenton.

New use for fake IDs

State and city officials were shocked into action by a recent investigation that found 425 Newark, N.J., residents were regularly collecting welfare benefits illegally in New York City using fake identification cards. Those benefits totaled more than $1 million.

The data-sharing program is expected to be in place by May or June, officials said, and may later expand to include Connecticut and Massachusetts. Hibbs said the New Jersey side of the matching program will cover more than a half-million welfare records and cost $15,000 for programming and analysis.

Matching is nothing new

The process of comparing names in agency databases to spot fraud or collect debts is known as "computer matching." While the tactic is not new — federal and state agencies have done hundreds of computer matches since 1977 — this is the first concerted effort to use computer matching to nab welfare double-dippers from neighboring jurisdictions.

Hibbs said her department will strip the names and Social Security numbers from its welfare databases and send the magnetic tape to the data center in Albany. There, a list-matching program running on the Univac mainframe will compare the New Jersey tape to similar ones from New York state and New York City.

The resulting "hits" — names or numbers that show up on multiple databases — will be given to welfare agents for investigation.

Matchmaker

Examples of computer matching programs

- The U.S. Postal Service conducts computer matches with law enforcement agencies to detect criminal activity by its employees.
- The state of New York used computer matching to catch accountants who failed to file their own state tax returns.
- The U.S. Department of Education's list of delinquent student loans is cross-checked with lists of federal employees to identify defaulters who work for the federal government.
- Many states comb the records of the U.S. Customs Service for leads on travelers and traders who fail to pay state taxes on imported goods.

The agencies involved all have different hardware platforms, but Hibbs said that is no longer a problem because the federal government created a standard data format for computer matching programs that all federal and state agencies use.

"The feds' [directive] requiring standard data formats and data elements has made all of our lives a lot easier," Hibbs said.

The welfare double-dipping problem is especially acute in the New York City area where there are 12 political jurisdictions in a close range, all connected by commuter train lines. For example, a spot check of 10 names on the Hudson County, N.J., welfare list found that eight were also collecting benefits in nearby New York City, according to Hudson County Executive Robert Janiszewski.

Fingerprinting works

Computer matching is not the only high-tech method of fighting welfare fraud. Some localities are experimenting with electronic fingerprinting as a way to get positive identification of welfare recipients.

Los Angeles County, for example, has a biometric ID system that matches the applicant's scanned fingerprint to an image database. Supporters claim it weeds out about 30 people per month who attempt welfare fraud, but critics say it discourages poor people from getting financial aid.

The fingerprint systems "stigmatize people because it is generally in the criminal context that people think of fingerprinting," said Robert Ellis Smith, publisher of "Privacy Journal," a newsletter in Providence, R.I.

Soon after implementation, 3,021 people refused to be fingerprinted and dropped out of the welfare system.

Commentary

Harold Lorin

Industrial strength redefined

At the heart of a conservative argument against technology or cultural change is the idea that only older mainframe systems such as MVS and VM or VSE have the robustness appropriate for corporate information processing.

These systems have shown their dependability and recoverability in complex, large multiuser environments for a long time. The argument is that they alone have the technology, the tools and the attitudes appropriate for mission-critical transactions and other applications. Industrial strength is defined across elements of availability, recovery, backup, synchronization and security on a large-system scale.

But as computing expands into the network, notions of industrial strength must be revised and redefined. Surely Unix, NT and NetWare Server will never reliably run MVS work loads with 5,000 users.

However, this idea of industrial strength is narrow, and MVS-type systems are new at backing up data on workstations, downloading applications, managing software licensing across user populations and coordinating transaction recovery for client and server.

Industrial networks

Advocates of the "new paradigm" claim that industrial strength at a single machine is no longer a key criterion; that industrial strength must be provided across the network; and that systems like NetWare 4.0 growing up from the bottom and large products coming down from the top are in a race to arrive at scaled network industrial strength.

A product providing this that runs on mainframes is the IBM Storage Division's Distributed Storage Manager. It provides storage management services across the network to a number of Unix clients, Apple, Windows, NetWare, Solaris and OS/2. It provides centrally managed, policy-driven retrieval and archiving across a variety of communications protocols.

Clearly, this kind of support, combined with products like MVS/Open Edition, gives some credibility to the idea of the mainframe as an open server and extends the notion of mainframe industrial strength to the network.

More and more, the attributes of small and large systems converge, and the barriers to flexible new-technology enterprise systems fall.

On the other hand, the network-oriented companies have surely overcome any notions that group, departmental or enterprise servers are toys. As part of their deep need to break out of disappearing niches and play "enterprise," the "new paradigm" companies have aggressively pursued technology that provides backup, recovery and software distribution services ranging from multiplatform mirroring to desktop and licensing management.

Challenging ideas

Perhaps Novell, with NetWare 4.0, is the best example of a company's positioning itself to industrial status, breaking out of a small LAN niche with global services across multiple dimensions of systems elements. Such products surely challenge our ideas of scale and industrial strength. Just as surely, the new kernels and new features of Unix have overcome any notion that Unix is an academic toy.

In all areas of industrial strength one sees the small environments growing up the network and the larger environments trying to extend their reach below. Small and large operating systems make similar claims to C2 or B1 security. It is not scale but history that prevents networkwide security.

Everyone is aiming for the same goals — cross-site backup, recovery, import and export. Confirming that there is nothing fundamentally more industrially strong about mainframe technology, the Distributed Storage Manager offers the same facilities of server backup on AIX and OS/2. The attributes of old and new converge, and the barriers to flexible new-technology enterprise systems fall.

Lorin is an author, principal consultant at the Manticore Consultancy in New York and senior adjunct professor at Hofstra University.

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CA, Candle develop alliance

By Thomas Hoffman

■ Like two ancient warriors whose conventional arsenals are facing obsolescence, Computer Associates International, Inc. and Candle Corp. have decided that it is better to coexist than fight — at least in the burgeoning client/server world.

CA and Candle recently announced a development alliance that will enable users of their forthcoming distributed systems and performance management tools to closely integrate the packages.

Under the alliance, CA and Candle developers will create software agents that will tightly couple CA's Unicenter distributed systems management packages with Candle's year-end delivery of its Candle Availability Command Center performance management tools. Candle's tools will run on Hewlett-Packard Co.'s HP/UX version of Unix, as well as on Sun Microsystems, Inc.'s Solaris, IBM's AIX and Microsoft Corp.'s Windows NT operating systems.

Details of the alliance remain sketchy. However, company executives said they will make further announcements this summer following product testing.

CA Chairman and Chief Executive Charles B. Wang stated his company hopes to have integration between CA and Candle distributed systems offerings by the time CA-Unicenter 2.0 begins shipping at the end of the year.

Analysts said it makes sense for CA and Candle to preannounce their distributed product integration to alert their respective customer bases.

Complementary products

"The products are certainly complementary," said Ed Acly, director of software research at Technology Investment Strategies Corp., a Framingham, Mass.-based research firm. "It's clear that CA doesn't have performance management in CA-Unicenter, and Candle doesn't have the scheduling and security in its product set," Acly added.

Under the alliance, Candle Chairman and Chief Executive Aubrey Chernick said Candle is expecting to leverage CA-Unicenter's strengths in security, scheduling and tape management. For its part, CA will tap Candle's expertise in performance management, hardware and software asset management and software distribution capabilities.

The CA/Candle alliance does not involve any cooperative marketing agreements. The Candle partnership will have no effect on Unicenter bundling agreements that CA has struck with hardware vendors such as HP and Data General Corp., Wang said.

Wang and Chernick said both companies have recently entered into discussions with several different network management providers to help shore up shortcomings in their distributed management offerings, though both executives declined to disclose further details of those talks.

Mainframes

CONTINUED FROM PAGE 89

in Framingham, Mass. — both forecast that the PTS hardware will cost closer to $20,000 per MIPS, at least as a starting point for negotiations.

IBM executives said the PTS should be competitive with Unix machines on a total cost basis that takes into account factors such as support, reliability and security. "It's not just the cost of hardware or even the cost of software [that matters]," said Nicholas Donofrio, senior vice president and general manager of IBM's Large Scale Computing Division.

Limitations exist

Analysts agreed that Unix mainframe alternatives are not likely to match the System/390 line in reliability, systems management and scalability for another 12 to 18 months. But they, along with some users, said the PTS is also saddled with limitations in its present state.

Tom Loane, vice president of computers and communications services at Alamo Rent a Car, Inc. in Fort Lauderdale, Fla., said the inability to share DB2 databases among multiple systems is a big drawback for the PTS. "When the [data-sharing] software is ready, it will be a good value," he said. "But the software is not going to be ready this year, so I might be a little bit indifferent [to the PTS] at this point."

Both the PTS and the new software pricing models (see story below) "look desirable," Burns said, noting that software costs could be reduced by an average of 10% to 30%. But initially, he added, most customers will likely see their savings offset — or even eclipsed — by the up-front costs of moving to the parallel technology.

The PTS links only to ES/9000 511 and 711 models, which IBM acknowledged make up just 15% to 20% of the installed base. Even companies that do not have to upgrade to a 511 or 711 to get a PTS will still have to buy IBM's new System/390 Parallel Sysplex Coupling Facility, Burns said. He described it as a "pay me now for savings later" approach by IBM.

No need to match price now

IBM also cannot lower the cost of mainframe computing by itself because 55% of the average data center software budget goes to other vendors, Burns said. Although he and other analysts said they expect mainframe software developers will eventually have to match IBM's price breaks, the major suppliers said they see no need to do so now [CW, April 11].

John Chapman, a senior technology consultant at Amoco Corp. and president of the Share, Inc. user group, said the PTS could remove "a very large thorn in the paws of some very big users" by allowing CICS transaction work loads to be split among multiple machines. But he added that it "is going to take some examination" before Amoco decides whether to purchase the parallel system.

John Wood, vice president of computer and network services at the Royal Bank of Canada in Toronto, is also interested but undecided. "School is out right now on what we're going to do, but we definitely are looking," Wood said. "We need something better than what we have" with traditional mainframes.

The elements of price

IBM's new mainframe software pricing structure includes three main elements:

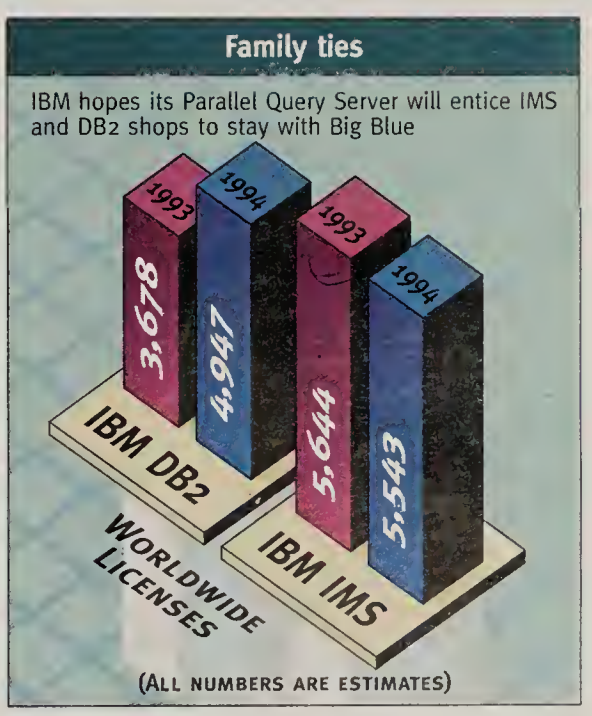
- **Elimination of Group 90 and 100** capacity pricing tiers, capping traditional licenses at Group 80 levels.
- **Measured usage pricing** on products such as CICS and IMS/TM. Rates will be based on fourth-highest day of CPU service unit usage during a one-month test period, then updated every six months according to the highest monthly usage. Usage can be aggregated across parallel systems. Heavy users may want to stick with capacity licenses.
- **Parallel Sysplex capacity licensing** for parallel and coupled systems. Based on aggregate CPU service unit capacity rather than MIPS. Provides a lower, more linear price curve than the traditional tiered model. Requires most recent releases of MVS and other software.

Query

CONTINUED FROM PAGE 89

manager of IBM's Large Scale Computing Divison, said PQS "is priced 35% to 50% better than the entrenched competitor" Teradata. Typical PQS pricing will fall in the $1.4 million to $1.5 million range, while high-end systems can cost up to $10 million, according to Roger S. Luca, manager of parallel solutions marketing at IBM.

But Dayton, Ohio-based AT&T Global Information Solutions is not giving up its lead so easily. Executives claim to have 400 Teradata machines installed worldwide, with more than 10 years' experience in parallel applications development to back them up. "The battle will not be won on pricing — it will be won on capabilities," said Andre Dahan, vice president of decision-enabling marketing at the company.



Machine pricing

Dahan added that Teradata machines, which comprise up to 1,024 massively parallel Intel Corp. I486- and Pentium-based microprocessors, are priced from $400,000 to $30 million.

To date, IBM has landed five PQS customers, though Luca and Cummings declined to name them.

In order for IBM to compete more effectively with its Unix foes, the company is planning to provide direct network attachment with PQS so that customers can connect into both SNA and TCP/IP networks, according to Gary Ferdinand, director of System/390 coupled systems at IBM.

Ferdinand would not specify exactly when the network attachment capabilities will be added, but said IBM is "strongly hinting that it's sometime next year" [CW, April 11].

No ties to the mainframe

By making the query server a stand-alone system that can attach directly to a network, PQS could then become a departmental system that "doesn't have to sit in the data center" tied to a mainframe, according to Charlie Burns, program director for large computer strategies at Gartner Group, Inc. in Stamford, Conn., and a former IBM Parallel Transaction Server/PQS product manager.

The PQS could halt the erosion of decision-support applications from the mainframe, "but there's not an incredibly big market in data centers for decision support," said Burns, who estimated that only 10% of IBM's biggest customers would use the decision-support system by the end of 1995.

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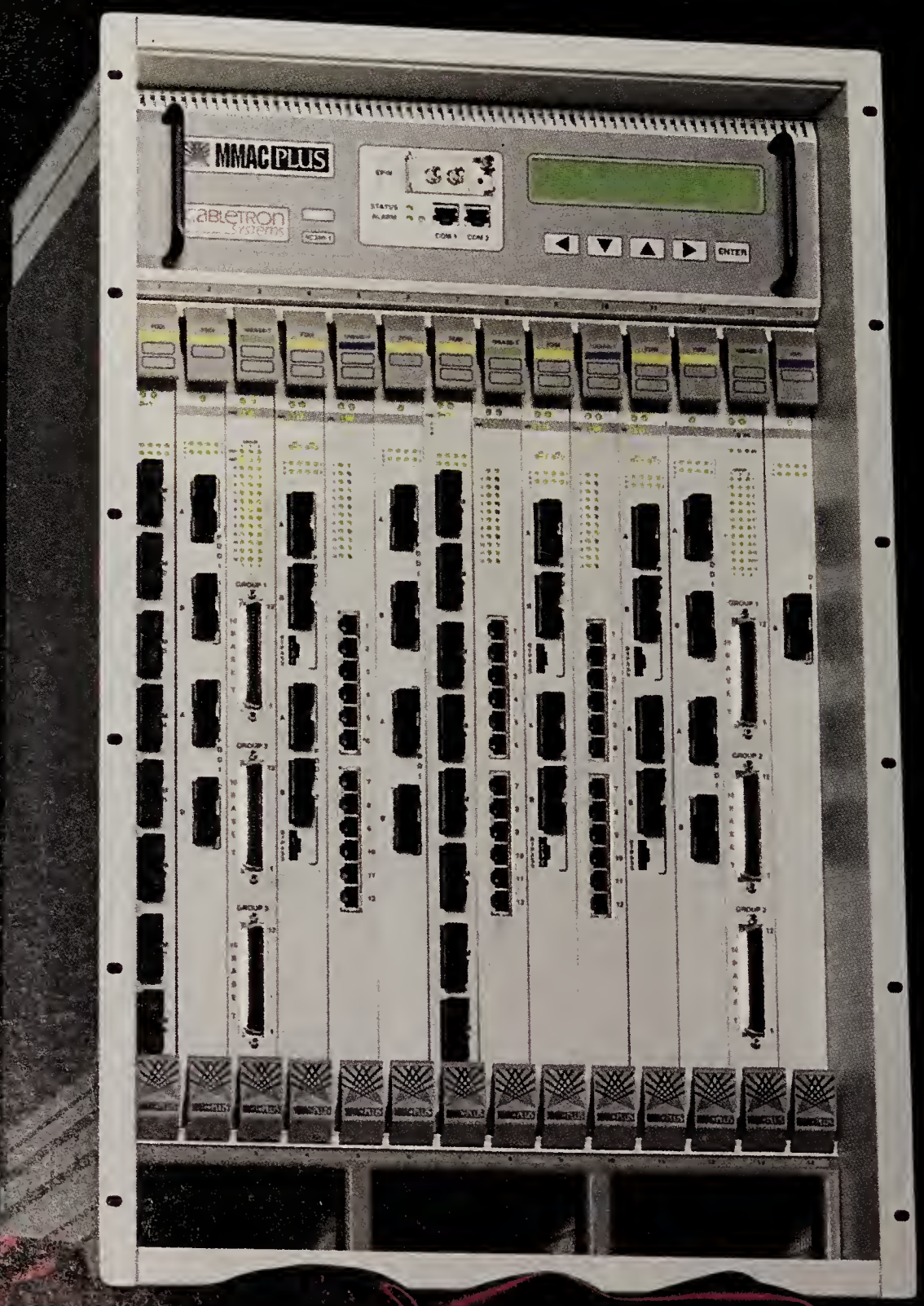

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Client/server software

D&B gives customers discounts, incentives

By Rosemary Cafasso

Dun & Bradstreet Software's new Customer Choice Program, a selection of discounts and incentives for maintenance and licensing, illustrates the company's plans to play more aggressively in the increasingly competitive client/server software market.

"It lets them hold on to clients and gives them a foot in the door for those customers moving to client/server," said Martin Garvey, a senior research analyst at Meta Group, Inc. in Westport, Conn. Customer Choice currently comprises four primary pricing or licensing options that make it attractive for customers to stick with the company's host software or move to its client/server offerings.

Among the options are a lock-in mechanism for maintenance and a rollover credit that will let customers swap their host software application module for the equivalent function on a client/server platform. In addition, some customers will only be charged 50% of the host maintenance fees during a client/server migration project.

Industry analysts said the Customer Choice program is an effort to prevent customers from defecting to other vendors, many of which offer attractive packaging and financing. Late last month, for example, SAP America, Inc. launched a soup-to-nuts bundle that includes hardware, software and consulting services for a fixed price of $500,000.

Some initial Customer Choice users said they benefit from D&B Software's competitive moves.

"It is like a gift," said Dennis Loewe, financial services controller at Weyerhaeuser Co. in Tacoma, Wash. "There was certainly no expectation of this."

Customer satisfaction

D&B Software's Customer Choice Program at a glance

Component	Availability	Description
Pricing Stability	Now	Lock-in maintenance fees at 1994 rates for a multiple-year contract
Preferred Purchasing Power	Second quarter	Will provide customers with client/server packages that include D&B Software's products and other software companies' products at various discounts
Value Account	Third quarter	Provides customized statement of services used
Line Item Choices	1995	Customers select individual maintenance items to create a maintenance package

Special consideration

Loewe also selected the Preferred Purchasing Power option, which will be officially available this quarter. With this feature, current D&B Software maintenance customers will be given "special consideration" when licensing the firm's Smartstream client/server software with other companies' software, D&B Software officials said. In other words, the firm will offer varying amounts of discounts when users buy these client/server packages.

Jo Ann Smith, applications manager at Presbyterian Health Services Corp. in Charlotte, N.C., called her selection of the Price Stability option a "no-brainer."

"The costs are going to increase each year," she said of her D&B Software maintenance fees. "This gives us an opportunity to have a fixed costs for the next three years."

Presbyterian Health Services estimates it will move to a client/server platform in about three years. Until then, Smith said she expects to save between 10% and 15% each year in maintenance costs.

Start-ups offer more support

CONTINUED FROM PAGE 89

larger company, you get people who come and go."

Landa, Inc., a Portland, Ore., company that provides environmental cleanup equipment, was the first beta site for Spectrum's Pointman client/server manufacturing software — a position in which Landa had not expected to find itself, according to Andy Gale, Landa's chief operating officer. It had been a Powersoft customer when that company sold the Growthpower line to Spectrum. Landa then found itself with a complete unknown as it contemplated moving to a client/server platform.

Reaching for billions

The 1993 worldwide client/server accounting software market was $302 million in revenue and is expected to reach $1.7 billion in 1998, according to International Data Corp.

Shrewd is good

Gale said he considered abandoning ship and moving to a more well-known vendor but then decided that working with Spectrum could prove beneficial after all. He said he made that decision because Spectrum had designed the new software from the ground up, making it what he considered a true client/server system.

Moreover, Gale said, the company wooed him but did not hand him the beta code for free, which actually boosted his confidence in the company. Gale said the executive's shrewdness suggested overall good business sense.

The original beta code had a variety of problems, including poor response time and other bugs, but the company regularly worked with him to resolve problems.

"Spectrum really takes care of us," Gale said. "I can't fathom doing this with a large company."

Small is good

Other users expressed similar sentiments. Joe Strathern, coordinator of information technology integration at Trimac Transportation Services Ltd., said his company's executive committee was "very concerned" when his team selected SQL Financials in October 1992.

"We became familiar with a lot of their people," Strathern said. "It was their willingness to help that got us around those concerns."

Thomas Willmott, a vice president at the Aberdeen Group in Boston, said the smaller companies are "not well-known but can have a tremendous amount of expertise — and they are often the companies, despite the low name recognition, that can have the best technology."

Briefs

ASK to ship OpenIngres

The ASK Group, Inc. said its OpenIngres family — a line of database and connectivity products designed to access rival databases such as those from Oracle Corp. and Sybase, Inc. — is expected to ship later this month.

CMS replaces IBM

CMS, a British Steel subsidiary and provider of on-line production and financial services, has replaced its 49 IBM direct-access storage devices and controllers with two **EMC Corp**. Symmetrix units. CMS said the move will save it $165,000 during the next four years in electricity and air conditioning costs.

Marcam, Ross settle suit

Marcam Corp. last week settled its 1993 lawsuit that claimed **Ross Systems, Inc.** infringed on a Marcam patent related to its manufacturing software. While full terms were not disclosed, Ross will license the Marcam patent and drop counterclaims against Marcam. Dennis Vohs, chief executive officer at Ross, said, "We didn't lose business, but it sure slowed down the sales [cycle] a lot."

DataTools expands to Sybase

Users of **Sybase, Inc.**'s SQL Server database will have two new options for systems management tools by year's end. **DataTools, Inc.** in Menlo Park, Calif., said last week that its NetWorker Module backup utility now supports SQL Server System 10.

Separately, **CompuWare Corp.** in Farmington Hills, Mich., announced a pact with Sybase to integrate database, network and operating systems monitoring tools with Sybase SQL Monitor.

Legent names VP

Legent Corp. said it appointed Daryll Wartluft, a former vice president at Groupe Bull Worldwide, to the post of vice president and general manager at its applications and database division.

ISSC signs health care deal

IBM's **Integrated Systems Solutions Corp.** has inked a seven-year deal to take over data processing for Birmingham, Ala.-based health care provider **ReLife, Inc.**

Comdisco recovers more

Comdisco Disaster Recovery Services said it has expanded its recovery ability for Tandem Computers, Inc. systems by increasing the number of Tandem machines it has at its Wood Dale, Ill., facility.

IBM debuts storage devices

IBM took the wraps off high-end storage devices for its RS/6000 customers. Based on redundant arrays of inexpensive disks (RAID) 5, the 3514 Models 212 and 213 include a 1G- or 2G-byte drive at prices starting at $3.40 per megabyte.

EMC adds AS/400 storage

EMC Corp. has introduced storage devices for AS/400 machines. The Voyager 3490 E series provides 48G bytes of backup. EMC said its Harmonix Integrated Cached Disk Array will support RAID Levels 0, 1 and 5.

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New Products

SAP America, Inc. has introduced the SAP Special Delivery Program, a bundled, prepackaged client/server product designed for companies that want to move from a mainframe system to a distributed system.

According to the Philadelphia company, the product includes the SAP R/3 financial, cost accounting and human resources software modules fully configured with Microsoft Corp. tools and Novell, Inc. networking, Hewlett-Packard Co. hardware, an Informix Corp. database and training services.

Package benefits include reduced evaluation and implementation time.

The prepackaged product costs $500,000.

▶ *SAP America*
(215) 521-4500

Sterling Software, Inc.'s System Management Division has announced Solve:Automation, a service-driven operations product created to ensure availability of critical information systems and business services.

According to the Reston, Va., company, Solve:Automation maps IS resources to specific business services, automatically implementing the policies and procedures responsible for keeping those functions or services available.

The product provides early error detection, automatic system recovery processes and on-line visibility of the system resources.

Pricing for Solve:Automation starts at $34,000.

▶ *Sterling Software*
(703) 264-8000

Firesign Computer Co. has introduced Outbound for Unix, a product that provides unattended file transfer between a mainframe and Unix workstation.

According to the San Francisco company, the product can be used for distributing software to remote branches and backing up PCs and network servers.

It can also be used to upload data from handheld terminals, cash registers and other devices.

Transfers can be done during off-peak hours because Outbound for Unix runs unattended.

The product is available for AIX on the IBM RISC System/6000 platform.

Prices start at $15,000.

▶ *Firesign Computer*
(415) 398-7228

Cincom Systems, Inc. has introduced Xpert Analyser Professional, a data analysis tool.

According to the Cincinnati company, the product helps banks, insurance companies and a variety of other organizations analyze their databases for trends or past decision processes.

Xpert Analyser Professional provides information that generates applications that improve loan approval processes, determine appropriate credit limits, profile customers for targeted marketing, set optimum insurance premiums and forecast insurance claims.

Features include interactive rule induction, which allows professional analysts to participate in the rule induction process, and a genetic algorithm to generate pattern rules and multiple decision trees.

Xpert Analyser Professional costs $995.

▶ *Cincom Systems*
(513) 662-2300

Product short

Infolink Corp. has introduced a software license service that audits PCs, Macintoshes and LANs for compliance with active software license agreements. Cost: $30 per computer. Infolink, Greenwood Village, Colo. (303) 773-8151.

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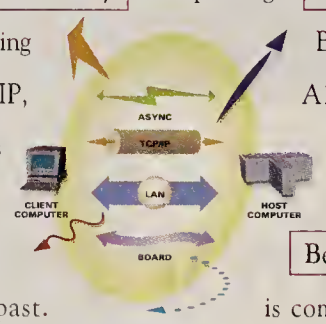

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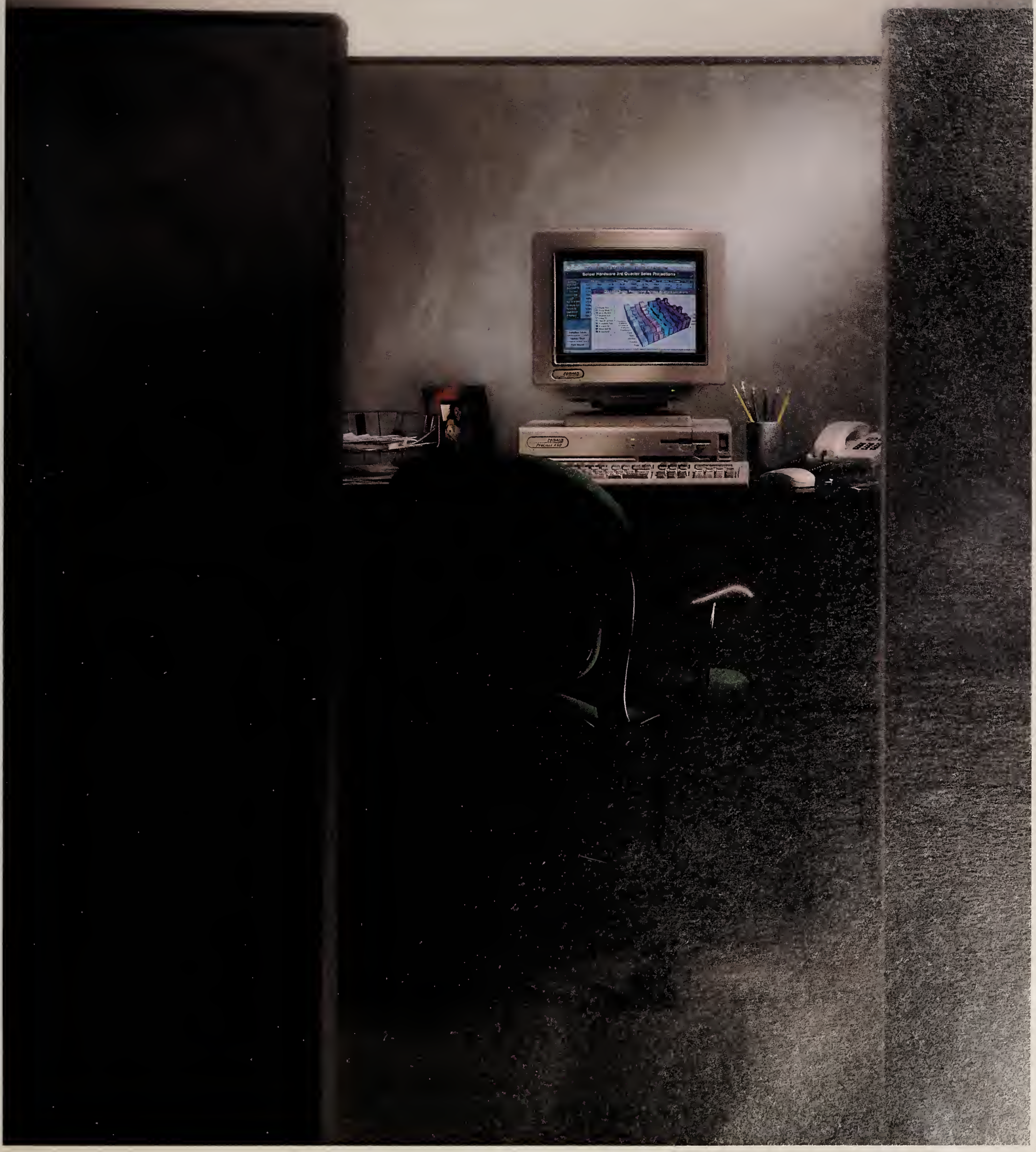

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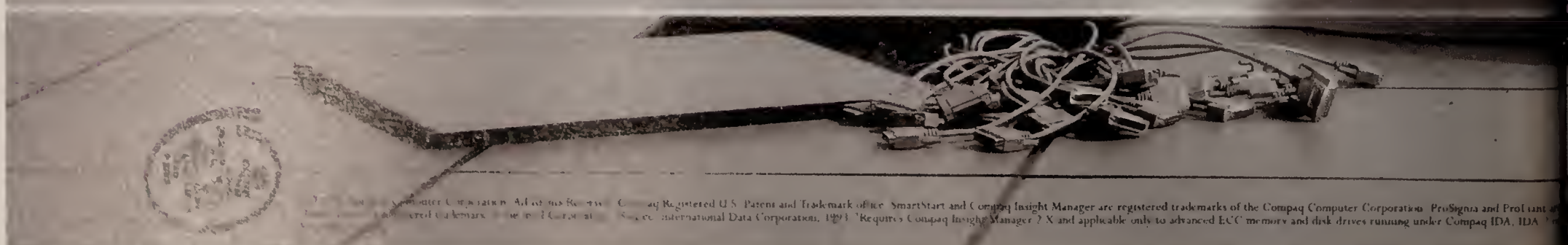

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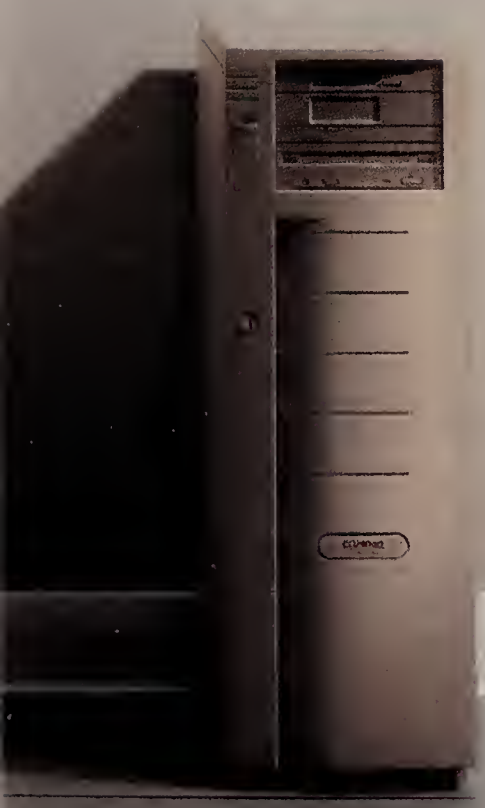

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Sun takes NextStep for Solaris object orientation

By Jean S. Bozman
and Melinda-Carol Ballou
SAN FRANCISCO

The upcoming integration of the Solaris Unix operating system with the object-oriented NextStep environment was one highlight of a developer's conference held here earlier this month. Another was the introduction of a starter kit for developers.

The OpenStep Developer Starter Kit includes Next Computer, Inc.'s NextStep development environment plus the application programming interfaces (API) needed to work with it under SunSoft, Inc.'s Solaris (see page 6). The full-fledged combination of Solaris, OpenStep and SunSoft's Project Distributed Objects Everywhere (DOE) is expected by March 1995 [CW, April 4]. Users who order the OpenStep starter kit will pay $3,995 and will be able to upgrade to the full production version when it ships.

The goal of the NextStep/Solaris integration is "seamless interoperability."
— Bud Tribble, SunSoft's vice president of object products

Observers said the most likely customers for the kit would be third-party software providers, which could use it to begin work on products such as interfaces to databases.

Special few

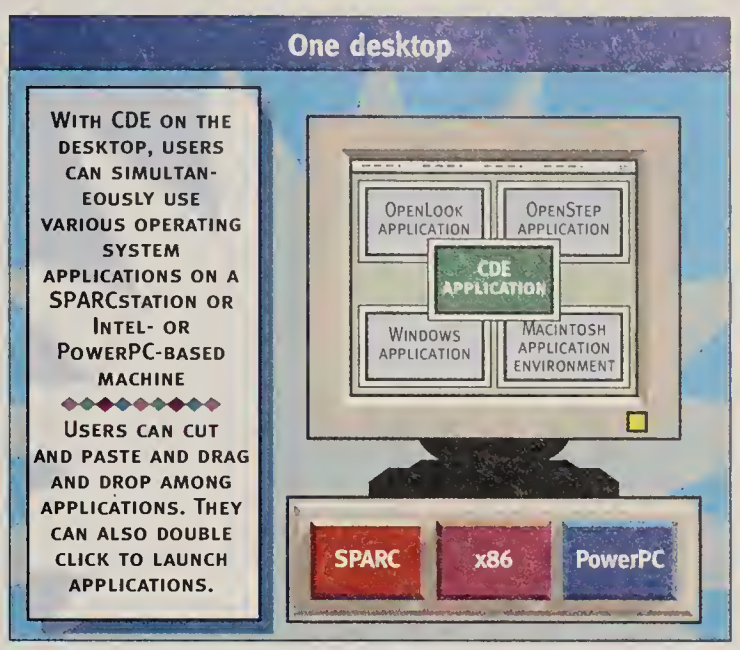
In addition, a new version of the Project DOE developer's kit for foundation object services will be shipped this month to a limited group of about 100 corporate and university sites for early evaluation and testing, SunSoft said. About 50 of those sites have the original Project DOE developer's kit, which has shipped since last summer.

Included in this second version of the DOE developer's kit is a richer set of Common Object Service Standards, such as display services for objects, or naming and directory services to make objects easier to locate. "This release is basically easier to use, has more functionality and fewer bugs," one corporate developer noted.

NextStep provides a mature object development environment with a set of APIs for system services and predefined objects and interfaces — all of which free programmers from having to know all the technical details of the object-oriented environment. Stitching that environment on top of the more basic object plumbing in DOE holds great appeal, several users and developers said.

"We're evaluating distributed object technology and Project DOE, which could

Sun, *page 112*



AppWare becomes network open systems linchpin

By Elisabeth Horwitt
SALT LAKE CITY

■ A side effect of Novell, Inc.'s decision to acquire WordPerfect Corp. was that AppWare gained strategic importance.

Announced seven months ago, AppWare is a family of tools and software layers for developing client-independent applications that access NetWare services.

When some industry watchers accused Novell of aspiring to Microsoft Corp.'s dominance of the client/server industry, Novell spokesmen cited the rapid expansion of AppWare Loadable Modules (ALM) as proof of Novell's good intention to open its services to third-party application vendors other than WordPerfect.

In fact, Novell said, it has also been moving quickly to provide third parties with open access to its own key services by converting them into ALMs.

At an AppWare update given at the recent Brainshare developer's conference here, Novell spokesmen said the company plans to ship the following ALMs next month: NetWare Directory Services (NDS), Message Handling System, Tuxedo, and Client/Server Database with support of the Open Database Connectivity standard. Novell said it plans to ship a Microsoft Object Linking and Embedding 2.0 ALM in the third quarter.

Playing fair or foul?

The question some Brainshare attendees continued to ask, however, was whether Novell, by encouraging third-party developers to adopt its client/server development platform, is providing a level playing field or simply gaining stronger control of the industry.

"If you accept the premise that it's a heterogeneous world, whoever provides the bridge controls the network," said Bob Buckman, a distributed application programmer at Gates Rubber Co. in Denver. "It's pretty obvious what Novell is trying to do: use AppWare to lock the corporate world to its version of the network world. Yes, you can use AppWare to access other directories, but it is still running on NetWare."

But Novell is forging ahead. Company spokesmen said Novell expects to release an ALM version of WordPerfect Office. This means third-party developers could potentially make use of WordPerfect Office features, such as workflow and message store, just as freely as messaging applications from Novell/WordPerfect.

In addition, Novell promised that AppWare Foundation, which provides portability across various client environments, will support Microsoft's upcoming Chicago and Daytona operating systems and IBM's AIX and OS/2 Presentation Manager by the second quarter. Foundation support for Microsoft's Win32 NT, Digital Equipment Corp.'s Alpha OSF/1 and the PowerPC is due out by the third quarter. Already supported are a variety of Unix systems, Apple Computer, Inc.'s System 7.x for the Macintosh and Windows 3.1.

Even more impressive from an openness standpoint was Novell's announcement at Brainshare of shipment dates for "universal interfaces" that are said to allow client applications to transparently access a type of service, such as messaging, in a variety of standards-based and proprietary environments. The rollout will proceed as follows:

- Universal Directory Service, due in the fourth quarter, will support NDS and bindery, Domain Naming Service and possibly Banyan Systems, Inc.'s StreetTalk.
- Universal Remote Procedure Call (RPC), due in the first quarter of 1995, will support Transport-Independent/RPC (used by NetWare), Open Network Computing and potentially the Open Software Foundation's Distributed Computing Environment. The service, co-developed with Noblenet, Inc. in Southboro, Mass., is said to allow programmers to migrate applications to an RPC-based distributed computing environment that can extend across NetWare and a variety of Unix platforms. The service is said to enable third- and fourth-generation language programmers to develop RPC-based applications even if they don't understand the underlying technology.
- Universal Pipes and Sockets Service is said to enable applications to cross between Novell IPX and TCP/IP networks, as long as an intermediary machine supports both. It is due out later this year.

AppWare lineup

▶ Visual AppBuilder
Description: A visual fifth-generation language tool that allows developers to call the various tasks, utilities and services as icons. Developers may then arrange them with lines drawn to designate relationships and order of procedures. Crucial pieces of AppBuilder are prewritten routines for common programming elements, such as graphical user interface utilities that programmers can reuse.
Status: To be released in May.

▶ AppWare Loadable Module
Description: A modular version of an existing service — directory, messaging or an application such as database management — that can communicate with other ALMs over the AppWare bus.
Status: Rollout began last year.

▶ AppWare Foundation
Description: A software layer designed to screen application developers from the differences in underlying client environments and provide automatic portability across a range of client systems.
Status: Began shipping last fall.

Tools help objects reach databases

By Melinda-Carol Ballou

Developers seeking to coordinate the advantages of object-oriented application development with access to corporate relational databases have a new option from Persistence Software, Inc.

San Diego-based Persistence earlier this month began shipping Persistence 2.0, a new version of its object-oriented tools, Relational Object Manager and Relational Interface Generator. These tools let developers build object-oriented C++ applications that can work with on-line transaction processing data located on Unix relational database management systems.

Object-oriented development techniques are of increasing interest to developers due, in part, to their ability to reuse and more easily maintain code.

But concerns about a tough learning curve, performance and the robustness of the technology have caused some sites to hesitate when bringing in these techniques, particularly for mission-critical, transaction-intensive applications.

Corporate developers also balk at the prospect of new, object-oriented databases when they already have a significant investment in relational technology.

The new version of Persistence targets these issues.

Cincinnati Bell Information Systems, Inc. is using Persistence tools to create an object-oriented cellular billing application and to manage the interaction between that application and its Oracle Corp. RDBMS. The application updates customers' bills and coordinates daily charges with a database responsible for billing customers monthly.

Support list
Databases supported by Persistence tools include products from Oracle, Sybase, Informix Corp. and The ASK Group, Inc.

"We viewed object-oriented databases as risky, based on their [lack of] maturity," said Eric Eriksen, application architect at Cincinnati Bell. He said his organization wanted a tool that provided an object-oriented view of data, performed well and coordinated with the Oracle RDBMS. "With this version, [Persistence] incorporated features such as array processing, which helped with performance issues, for instance," he said.

Eriksen said that while the company still may experience a slight performance hit using Persistence tools, the "trade-off is in our favor because we can reuse objects in multiple transactions, and developers are shielded from data access methods."

Federal Express Corp. is also using Persistence tools to create a fleet operations control and management application with C++ and a Sybase, Inc. RDBMS, according to Persistence officials.

Relational Object Manager manages the flow of data between the object-oriented application and the RDBMS. The Relational Interface Generator lets developers create a tight interface between the object model for the application and the relational database. This is how Persistence 2.0 bridges the gap between the object-oriented structure of the application and the relational database.

Unique features

Persistence 2.0 competitors, including Hewlett-Packard Co.'s OpenODB and offerings from UniSQL, Inc., do not provide the same range of support for standard languages, some industry analysts said. Persistence 2.0 supports C++ and standard SQL; competing products include proprietary fourth-generation languages and proprietary, non-SQL back ends.

"It's important to be able to pick your back-end database. The approach Persistence is taking is the right one — to offer a consistent object interface to allow users to access and update relational data," said Michael Goulde, an analyst at Patricia Seybold Group in Boston.

Persistence 2.0 is shipping now on HP's HP/UX and Sun Microsystems, Inc.'s Solaris. It costs $3,000 per developer's license. It will be available for Windows 3.1 and Visual C++ later this year.

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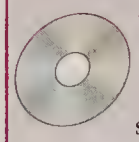

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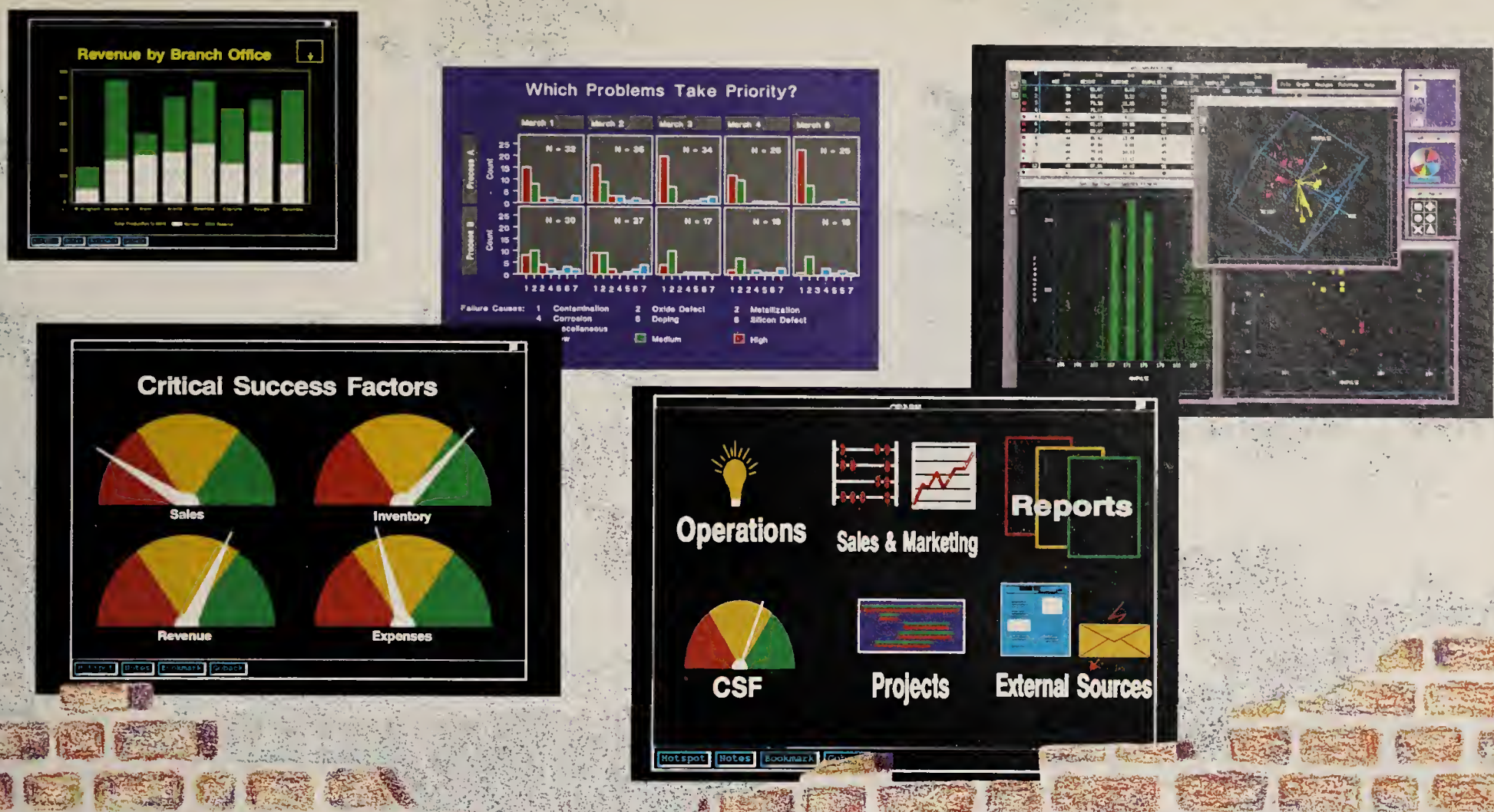

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REMOTE COMPUTING THAT GOES FAR AND PSEUDO-EXECUTIVES

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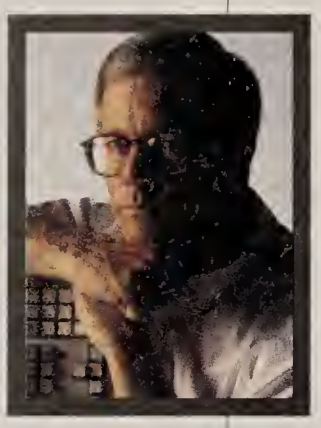

First came the mini with a string of dumb terminals. Then came the workstation. Followed by the desktop PC. Which led to the portable PC. Which led to the laptop. The smaller notebook. The subnotebook. And finally, the Personal Digital Assistant.

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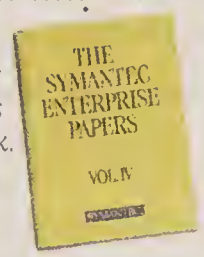

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Commentary

E. Ted Prince

Moving objects

Will objects be king? Although the acronyms say yes (can OLE, OpenDoc, Visual Basic, Smalltalk, C++ be wrong?), I have a different perspective.

The great thing about objects is the room they give the academics and theoreticians to argue about their purity. Reminds me of structured methodologies and the time we all wasted arguing about whose code was more structured. This time around the terms are changed, but the idea is the same — inheritance, classes, libraries. My software is more truly object-oriented than yours.

The fact is that real people writing real code do things that real theoreticians don't because there's no time, and they don't understand it anyway. So true application development tends to pick up the nearest and quickest paraphernalia it can find and uses it willy-nilly. That's the beauty of Notes and E-mail. Modern tools include these, as well as workflow, docuconferencing, brainstormers and the like. The reason is that they're simple, intuitive and reflect the way we do things in the real world.

The other thing is that models don't mean much if there are a lot of them. Once you get six ways to write a structured methodology, everyone gives up. It's too difficult and costly trying to keep up with the different and moving dialects and methodologies. Faced with such arcane choices, the huddled masses (as distinct from the professionals) invariably revert to type, which means quick and dirty.

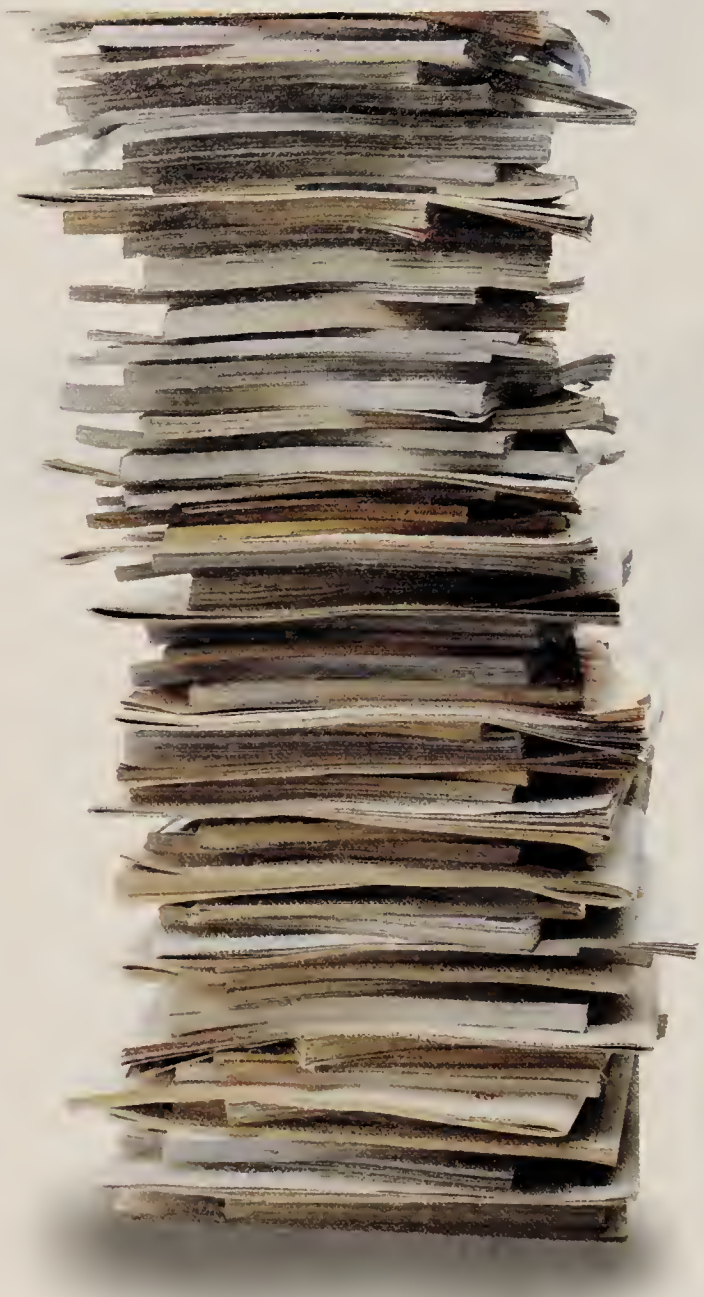
True application development is about storytelling and scenes rather than models. It's about hunches, funny links, coincidences and parallels. It's also about conversations, my guess vs. your guess and guess what. That's the true significance of E-mail, Notes, OpenDoc, OLE and document-centric computing, generally. They all help us tell our stories better without needing the electronic witch doctors to tell them for us and in the process replace our meaning with theirs.

That's why we have new classes of nontraditional software merging to allow you to develop applications in intuitive ways. Some of it takes the model of the white board, some a conversation. The market is voting with its feet on how it wants to develop its applications.

We need the theorists, of course. Even stories need structure. And models are just as important, if not more so, for telling us what to avoid as they are for telling us what to do. So I'm not knocking objects and their methodologies or software based on them. Just don't expect the masses to buy them, that's all.

Expect to see a lot more about objects, the post-object (agent?) model and the application of current object approaches to new object forms such as live animation and games. You might even see many people using them and, even more probably, spending a lot of time figuring out how to use them. They'll mainly be the professionals. But whatever we do, the nonprofessionals will be out there using all the new impure storytelling stuff, electronically nattering amongst themselves and creating their own models. So we might as well get with the action.

Prince is president of Perth Ventures, Inc., a technology publishing and mergers and acquisitions firm in Hawley, Pa. He can be reached by CompuServe at 74073,1236.



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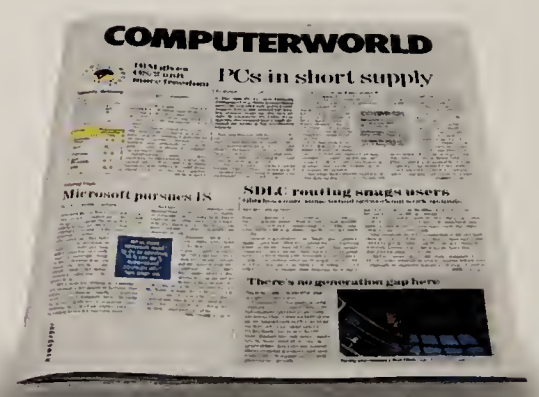

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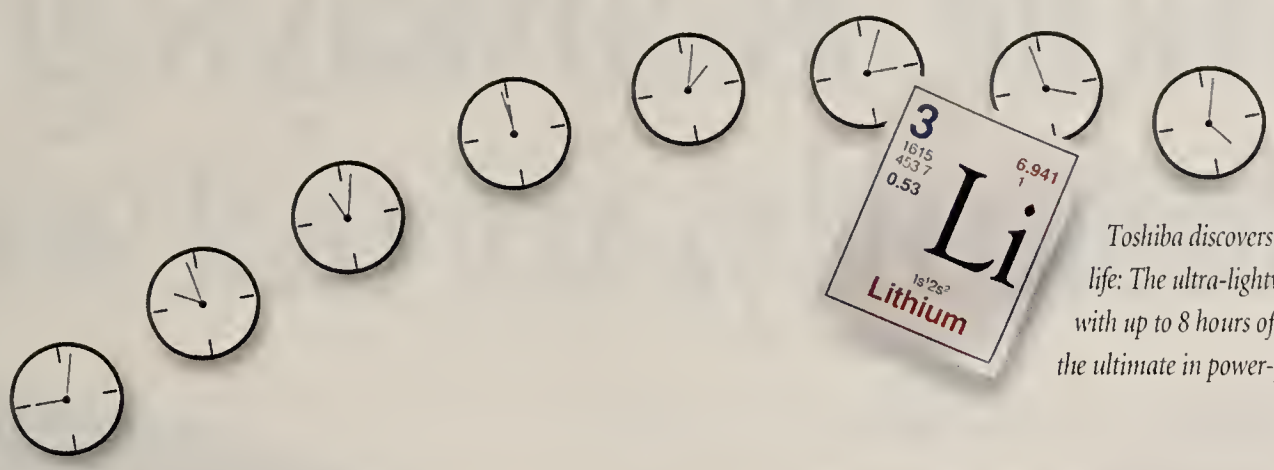

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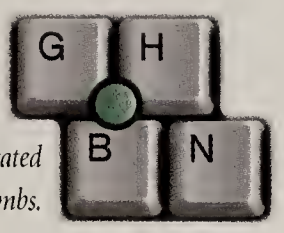

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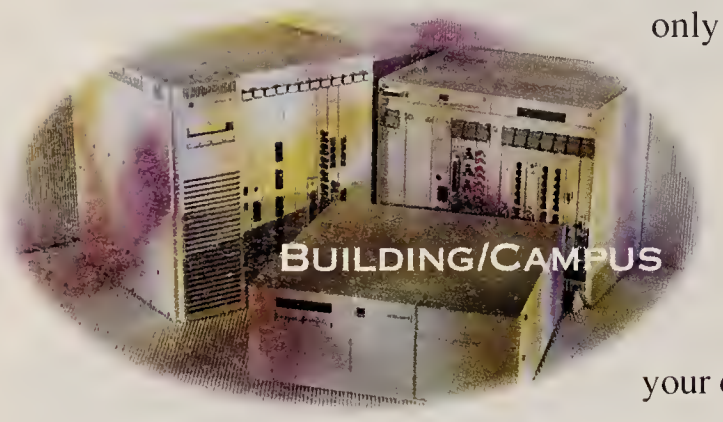
Incidentally, in network

As confusing as it sounds, there truly are two completely opposing ways to look at high-performance networking. One is the big picture, the sum total of your network. Because it's only by viewing your network in its entirety that you can be sure it's carrying your organization toward the future without compromising the investments you're making today. Conversely, you can't afford to overlook the smallest detail either. After all, unless it responds and even anticipates the needs of the individuals using it, a network has failed to live up to its potential.



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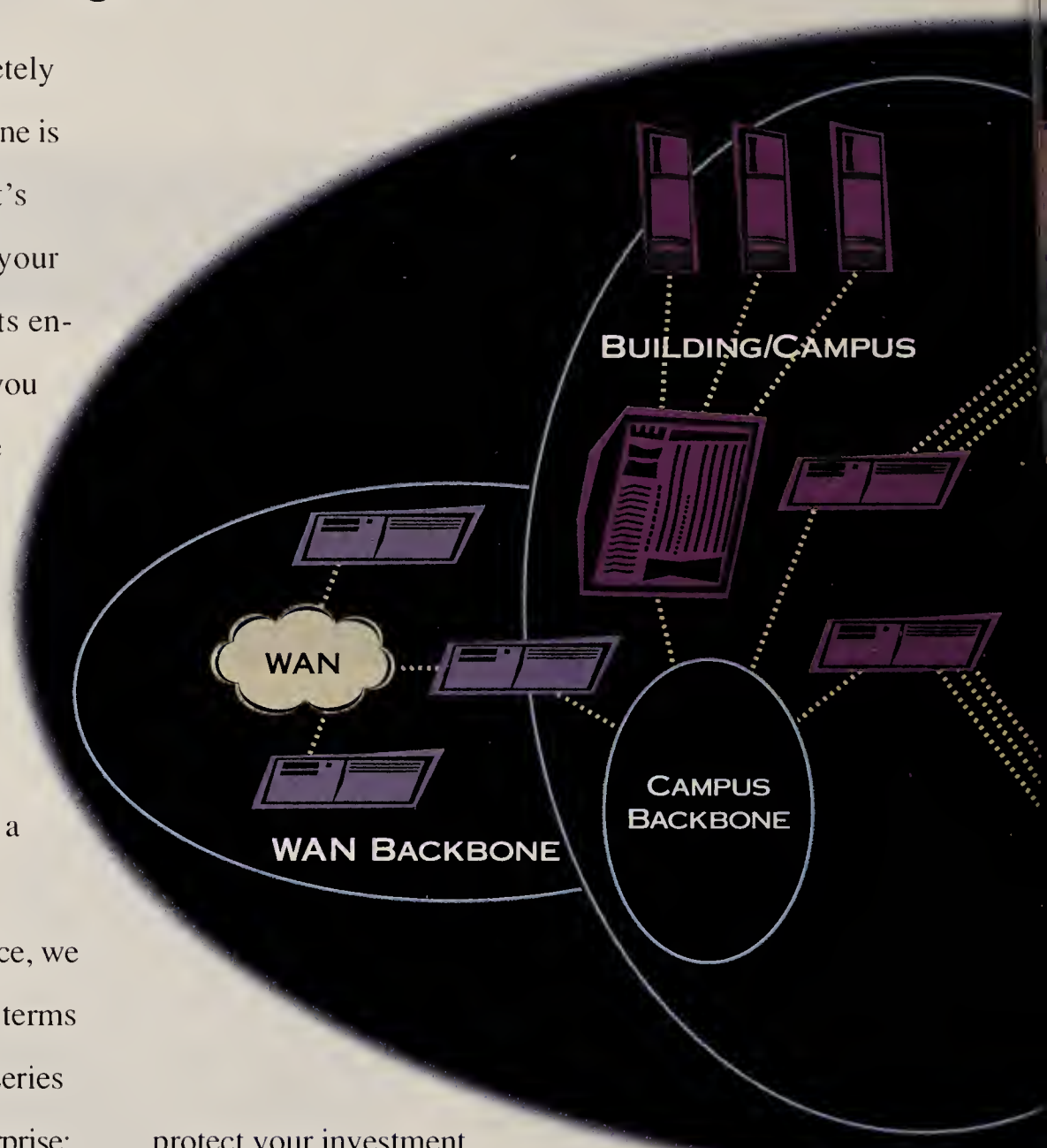

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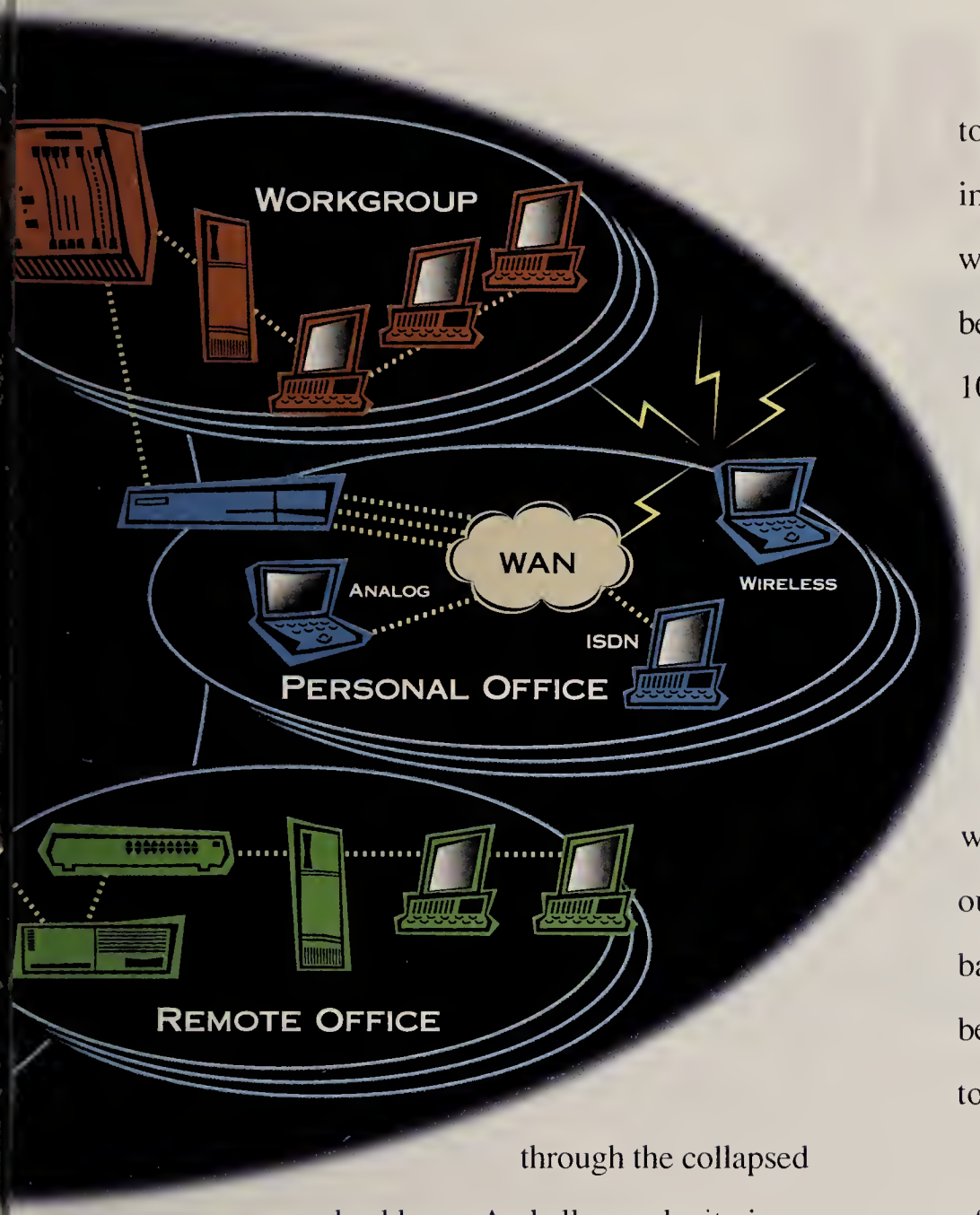

through the collapsed backbone. And all complexity is centralized, where administrative costs are substantially lower.

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CONTINUED FROM PAGE 103

provide us with integration glue for disparate systems," said Eric Worth, a staff engineer at ESL, Inc., a subsidiary of TRW, Inc. in Sunnyvale, Calif.

Worth, who beta-tested the early developer's release of Project DOE, said he expects the NextStep/Project DOE integration to strengthen both products and facilitate the development process by letting him reuse objects, for example.

"DOE is well-thought-out, and the Next relationship brings [Sun] a proven product set with value-added built into it," said Rikki Kirzner, an analyst at Dataquest, Inc., a market research firm in San Jose, Calif. "There's both skepticism and hope in the user community about whether this will work, but I'm very impressed with what I've seen so far."

Other developers are waiting before jumping on the bandwagon.

"I'm glad that Sun's picking up NextStep, but I'm not sure what it means for Burlington Coat at this point," said John Peiffer, manager of information services at Burlington Coat Factory Warehouse Corp. in Etna, N.H. "We're still grappling with the implementation of things we've been doing for the past several years, and it's difficult to assimilate."

The goal of the NextStep/Solaris integration is "seamless interoperability," said Bud Tribble, SunSoft's vice president of object products. Key to that effort is compliance with the Object Management Group's Common Object Request Broker Architecture (CORBA) 2.0. The request broker acts as a kind of traffic cop for objects, routing them and letting them communicate with one another. Support for CORBA 2.0 will let NextStep and Project DOE interoperate with other vendors' CORBA-compliant products.

Awaiting CORBA

Steve Jobs, Next's chief executive officer, said he is anxious for the CORBA standard to be settled; the final specification is expected later this year. "We're not going to make money off plumbing," Jobs said. Instead, he said, finished business objects should be created for use in class libraries that can be sold for reuse.

Sun also said it will support two different graphical user interfaces (GUI) with its OpenStep product. One will be the Common Desktop Environment (CDE) from the Common Open Software Environment (COSE). This is a top priority for Sun Microsystems, Inc., IBM and Hewlett-Packard Co. Indeed, all of the vendors in COSE — now part of the Open Software Foundation (OSF) — have agreed to support the CDE screen, or "common dashboard," on Unix workstations. CDE will use the OSF/Motif GUI.

However, as Sun evolves NextStep into OpenStep for Solaris, it will also seek to provide a familiar environment to current users of NextStep. Users will be able to switch from one interface to another, and they will be able to cut and paste text between the two windows on-screen.

"We will provide an OpenStep Window Manager, which will have a NextStep look and feel," Tribble said. "It's an option when you log in." However, he added, "It is our goal to evolve toward a uniform look and feel, but it will take time."

Judith Hurwitz, president of Hurwitz Consulting Group in Watertown, Mass., said it could be a smart strategy. "They're hedging their bets about both environments. Whichever one works, whether it's NextStep or CDE, they want to be there."

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New Products

ParcPlace Systems, Inc. has announced VisualWorks ReportWriter Release 1.0, a client/server database reporting tool.

According to the Sunnyvale, Calif., company, the product allows corporate developers to visually create reports without database programming.

Users can build reports using a point-and-click approach then deploy them on Windows, Macintosh, OS/2 and Unix platforms.

ReportWriter 1.0 features multipass reporting, full support for sorting and grouping, interactive data browsing and extensive calculation capabilities.

ReportWriter 1.0 costs $750.

▶ *ParcPlace Systems*
(408) 481-9090

PC Com, Inc. has introduced its Mainstation Application Development System.

According to the Elsmford, N.Y., company, the product can off-load application development, maintenance and testing from the mainframe.

The PC Com Mainstation hardware includes an IBM PS/2 with a coprocessor and a complete IBM mainframe on a PS/2 adapter card.

The product supports a variety of PS/2 and mainframe I/O devices. The basic software offering for Mainstation includes the VM or VSE operating system for the mainframe coprocessor and OS/2 with Rexx, Windows and Micro Focus, Inc.'s Cobol Workbench for the PS/2 processor. A basic tool set is included.

Pricing for Mainstation starts at $24,850.

▶ *PC Com*
(914) 592-0002

Michaels, Ross & Cole Ltd. has introduced Release 5.0 of the mrc-Productivity Series, a fourth-generation language/computer-aided software engineering application development and report-writing tool.

According to the Lombard, Ill., company, Release 5.0 offers users a Windows-like enhanced, nonprogrammable terminal user interface menu bar and the ability to reduce the number of access paths and logical files on the system.

Other enhancements include more intuitive screen layouts and calculation options, a file joining facility that allows users to modify incorrectly joined files and a template validation command that analyzes templates for correct syntax.

Pricing for the mrc-Productivity Release 5.0 ranges from $4,000 to $70,000.

▶ *Michaels, Ross & Cole*
(708) 916-0662

VisualTools, Inc. has introduced Formula One/VBX component software.

According to the Lenexa, Kan., company, Formula One/VBX provides a custom control that creates a spreadsheet functionality accessible from within a developer's application.

The product can be used as a data browser or record editor. Formula One/VBX also has a virtual mode that enables developers to implement the product as a front-end application to any size database.

Formula One/VBX costs $295.

▶ *VisualTools*
(913) 599-6500

Diamond Head Software, Inc. has announced ImageBasic 1.1, a document imaging development tool kit.

According to the Honolulu company, the tool kit allows users to create full document imaging applications in a few days.

ImageBasic 1.1 is fully integrated with Microsoft Corp.'s Visual Basic and offers a variety of optical character recognition engines, bar-code recognition, intelligent character recognition, image printing hardware and support for more than 100 scanners.

ImageBasic 1.1 costs $1,790.

▶ *Diamond Head Software*
(808) 545-2377

Product short

BlueWater Systems has announced the WinRT Tool Kit, a tool kit designed for developing Win32 real-time applications for Microsoft Corp.'s Windows NT. The product allows Win32 developers to write programs that directly access port I/O, memory I/O and interrupts. Cost: $595 for single users. BlueWater Systems, Edmonds, Wash. (206) 771-3610.

Fitting right in, thank you.

How is it that a supposedly 'proprietary' business computer is rubbing elbows with names like Sun, Hewlett-Packard, Apple, Novell, and DEC? And in a Client/Server environment, for goodness sake!

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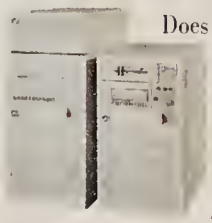

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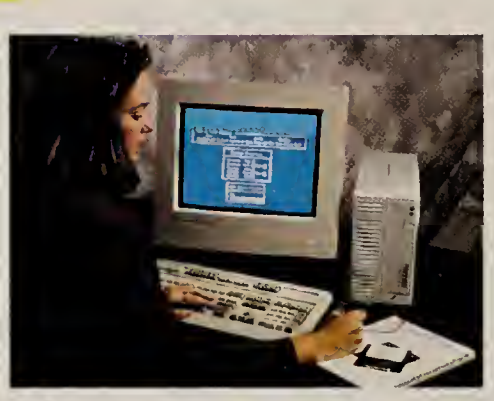

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ARCHITECTURAL DIGRESS

Creating an INFORMATION ARCHITECTURE is a key concern for IS managers. But the best laid plans of IS architects are losing out to indifference, cost cutting, client/server projects and increasingly independent user departments.

BY JOSEPH MAGLITTA

At high-flying Airborne Express, David L. Griffing is something of a lone eagle. During the past two years, he's tried unsuccessfully to raise interest in information systems architecture.

"We're very tactically oriented," explains Griffing, technical architecture manager at the Seattle-based air transport carrier. He says managers are often too busy with pressing business matters to discuss the seemingly arcane topic of longer-range technical planning.

"Mostly I get a lot of blank stares," he says. "It's a major difficulty to get them excited."

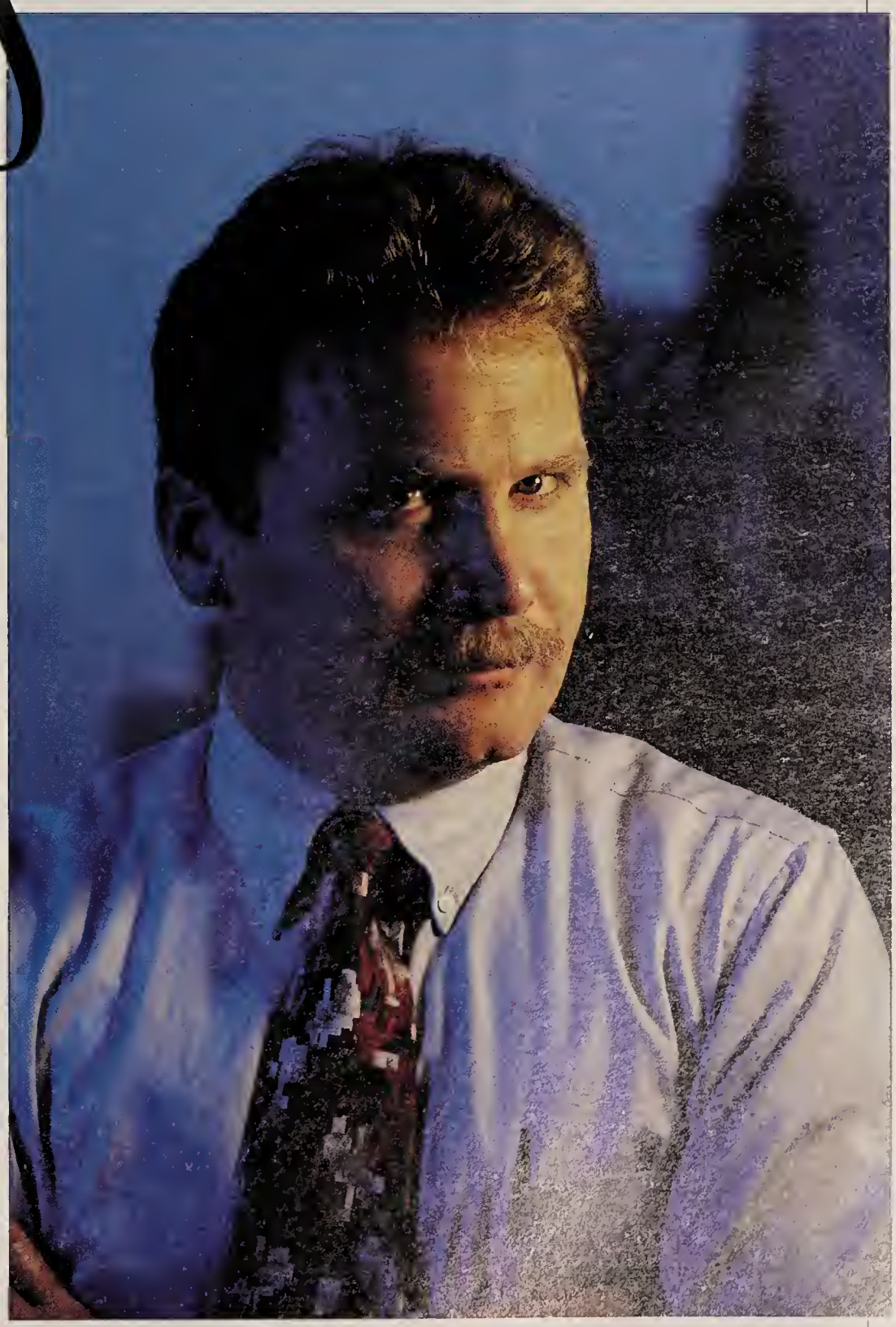
A not-so-funny thing happened on the way to the right-sized, interoperable, standards-based, process-focused, distributed technology and business master plan: daily life.

Some large organizations are finding that front-line pressures — such as executive indifference, skittish customers, cost-cutting demands, rapid technology changes and user departments that are becoming increasingly independent — are making it more difficult to craft and follow a coherent enterprisewide technology plan.

And companies that do succeed are finding that the push to blend legacy applications with client/server and open systems, like many mass migrations, is slow, maddening and often messy.

"There are some awfully patched-up archi-

Architecture, *page 121*



▲ VP Jim Swanson says CS First Boston will bring distributed computing to mission-critical areas

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- Consider broadband network management architectures and protocols, such as the Local Management Interfaces (LMI) and the Customer Network Management (CNM) systems.
- Contrast the operation of Frame Relay and X.25 protocols.
- Learn how existing transport technologies such as TCP/IP and Novell's NetWare can be integrated with broadband protocols.
- Understand how SONET and fiber optic transmission will fit into broadband networking.
- See how SNMP will play a key role in broadband network management.
- Be prepared to evaluate the broadband service offerings from the Local Exchange Carriers (LECs) and Inter-Exchange Carriers (IXCs).
- Discover the roles of the broadband implementers: the ATM Forum, the Frame Relay Forum and the SMDS Interest Group.
- Obtain the status of the current standards for ATM, Frame Relay and SMDS.

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Architecture

CONTINUED FROM PAGE 119

tectures out there," says Peter G.W. Keen, director of the International Center for Information Technologies in St. John, U.S. Virgin Islands.

Many companies install a Unix front end, standardize on Windows or install distributed object databases, Keen says, and wrongly believe they have a unified technology plan.

"But there's no coherence in the architecture. It's a series of extended bits and pieces and a bizarre mishmash they can't even document." He tells of one government agency, for example, that had 133 incompatible networks.

Keen and others worry that making technology decisions reactive instead of proactive could seriously hamper future competitiveness.

"Because business changes so fast, if you are going to build new technology applications to support business needs, you can't be always starting from scratch," says Thomas Davenport, a consultant at Ernst & Young's Center for Business Innovation in Boston.

A loosening grip

Ironically, at a time when IS should be exerting greater control over rising costs and the accelerating pace of technology through architecture, its grip seems to be loosening in some companies.

Many IS managers and architectural planners don't like to admit it, but "from a network or architectural standpoint, there is no notion of [IS] control in the old sense," says Jerry Loev, president of CSC Impact, an IS management consultancy.

New products and technologies such as groupware, high-speed Asynchronous Transfer Mode networks or the recently announced plans by AT&T and Lotus Development Corp. to create a "business Internet" promise to further complicate architectural planning.

Awareness is not a problem: "Creating an IS architecture" once again made the Top 5 concerns in CSC Index, Inc.'s annual poll of more than 500 IS executives.

Far less clear, however, is exactly what "architecture" means today and how it should be best planned and implemented, Loev and others say. "I think a new paradigm is charging in on us possibly faster than we are preparing for it," Loev says.

Front-line pressures

Ideally, consultants say, every organization would create a detailed plan that combines business directions, technology, process and human resources into a cohesive whole.

Yet IS executives and business heads — even those in companies with well-defined technology plans — say front-line pressures are influencing technology strategy more than ever.

In many cases, for instance, companies opt for low-cost PCs and workstations — even though existing mainframe and minicomputer systems may actually be cheaper or offer a more mature and stable environment.

The temptation is easy to understand, says Rick Storts, assistant vice president at Huntington Service Co., a Columbus, Ohio, unit of Huntington National Bank, a $17 billion regional holding company. "The cost of hardware in the conventional host environment with Tandem, Stratus or a high-end IBM host is incredible," Storts says. "You have to justify $500,000 worth of hardware and operating system before you burp the first line of code onto the screen."

Storts is fortunate: One of his recent projects — establishing the nation's first private check-clearing system for a new nonprofit organization, The National Check Clearing House, on Sun Microsystem, Inc. SPARCstations — was a success. Yet he knows the downside of distributed architectures, too. He's been through two failed open systems forays with Digital Equipment Corp.

"One cost us an arm and a leg," he says. "DEC failed to get us the firmware and communications cards we needed. We finally just canned the project."

In some companies, skilled business managers are taking larger roles in setting technology and architecture direction, adding another voice to technology planning.

At SmithKline Beecham Consumer Brands in Pittsburgh, for example, Ed Neville serves as a liaison to IS from the company's logistics management function.

Neville, a manager of systems and analysis, figured the department could save $40,000 monthly in charge-backs by switching a supply chain logistics system from the corporate mainframe to a client/server system on an IBM AS/400 and RS/6000.

Despite problems in finding experienced client/server help, he plans to champion a follow-up effort when the current project is finished later this month. ("We found a contractor in Texas who wouldn't even work for us because he said the project wasn't challenging enough," Neville marvels.)

"I can program in SQL with the click of a mouse button," he says. "IS needs to facilitate change and let us grow."

Although exact breakdowns are hard to come by, consultants say much of the boom in client/server growth is being driven by user departments.

Unfortunately, efforts that are too independent from IS can quickly cultivate architectures that look more like wild tangles of vines than carefully planned orchards, notes Jeff Plewa, a Deloitte & Touche partner.

"Some of the disasters I have seen have been where a business group [vice president] will run the show and have a guy who works on a Mac at home or who reads *PC Magazine* try to do too much. They lead the charge down something and don't get IS involved," Plewa says.

Something to prove

Despite the apparent cost benefits, users and IS report another stumbling block: proving the stability and economy of distributed architectures and systems. "Our customers want fast system changes to keep up with the business," says Jim Holtman, vice president of technology architecture at Cincinnati Bell Information Systems. The 3,500-person unit's duties include the billing for 60% of the nation's cellular phone providers.

"Yet they also want you to show another example of 3 million customers moved to open systems. That's hard to demonstrate, so we move them over a small piece at a time. You start at ground zero and build up the load," Holtman says.

"I don't think anybody has a problem talking about 1975's architecture problems. Fifteen years from now we'll know what works for 1995."

Jerry Loev, president, CSC Impact, Cambridge, Mass.

"The move to client/server is not a slam-dunk done deal," adds Charles Plesums, senior director of systems architecture at U.S. Automobile Association in San Antonio.

"Every time we've done a cost analysis, it's not just cost of hardware running and installing hundreds and thousands of servers. It's more expensive to run client/server than to run our mainframe systems," Plesums says.

Ironically, opposition to architectural planning can come from within IS groups themselves, notes Rose Taylor, general manager of planning and architecture at Chevron Information Technology Co. in San Ramon, Calif.

"Business units often love architectural standards and plans because they understand the cost benefits," Taylor says. But many IS staffers entered the profession because they enjoy exposure to the latest technology, she notes. "They can feel that you're limiting them."

Companies that have managed to craft a technology plan are determined to stick with it. A few years ago, CS First Boston Corp. purchased 500 Sun Unix workstations for traders and others.

Today, Jim Swanson, vice president of information services, says the brokerage is committed to making the distributed environment work in mission-critical areas. "We're not likely to change any time soon or frivolously go off in any given direction," he says.

Yet new architecture also means new headaches. For starters, brokers demand high uptime. In a crash, users "start screaming as soon as they hit the carriage return," Swanson says. So he's focusing on improving monitoring, redundancy and central management of the network.

"Our biggest problem is Unix mirroring and reliability," Swanson says. "Unix hasn't changed that much in 10 years. They've fixed a lot of bugs in packages, but it's not a coherent environment."

Too much focus on middle?

With IS planning now distributed with systems and data, Keen worries that too many firms are trying quick architectural fixes based on middleware solutions based on Windows NT, OS/2 and Novell, Inc.'s NetWare.

"Most IS managers are not really familiar with architectures," Keen says. "They are giving it over to really smart juniors and ending up bewildered." True architectural planning, he suggests, requires close partnership between architect, business client and implementor.

Some might consider the approach taken by Chevron. There, "architecture decision teams" consisting of seven to 12 members are systematically working to establish corporatewide standards in hopes of lowering costs and improving integration.

Lately, groups have focused on establishing standards for servers rather than PCs, Taylor explains.

At Airborne, Griffing has decided to keep up his crusade. "I'm not willing to abandon architecture yet," he says.

His new approach: embed an IS architectural plan into each project. "We are creating a technology project view of architecture," he explains.

Fortunately, a new Deloitte & Touche survey shows that most companies are still doing only the most elementary kind of distributed computing: sticking a graphical user interface on a legacy system. Besides illustrating the difficulty of distributed computing, the statistic suggests that IS may still have time to regain architectural control.

Loev predicts there will be no easy answers. "I don't think anybody has a problem talking about 1975's architecture problems," he jokes. "Fifteen years from now we'll know what works for 1995."

Maglitta is *Computerworld*'s senior editor, corporate strategies.

OF CLEAR CONCERN

Although definitions are fuzzy, information architectures remain a top IS management issue for 1994

	MANAGEMENT ISSUE
1	Re-engineering business processes
2	Aligning IS and corporate goals
3	Organizing and using data
4	Instituting cross-functional information systems
5	Creating an information architecture

Source: Survey of critical information systems issues, 1994, by CSC Index, Inc., Cambridge, Mass.

MEASURING IS QUALITY

Dallas' qualitative edge

The award-winning quality circle at the Dallas IS department traces internal problems to their roots — and avoids finger-pointing — for dramatic results

By Mitch Betts

Many give lip service to the "quality circle" concept, but few information systems departments have made quality teams a routine part of their everyday operations. Fewer still have achieved quantifiable benefits.

That is why the IS quality team for the city of Dallas stands out. It is also why the group recently won the 1994 "Best of the Best Award" in the IS category from the Quality Assurance Institute.

At the Dallas Department of Information Services, quality assurance has been fully institutionalized, with documented procedures in place since 1986. The quality circle, called the Production Control Committee, meets weekly to discuss all problems reported the previous week and brainstorm about solutions.

Frontline IS personnel log all production problems, such as abends (abnormal terminations that require manual intervention to complete the job), missing reports, incorrect data and water bills printed upside down.

After compiling the reports, the committee holds a one-hour meeting to identify the biggest problem areas. It then farms the problems out to subcommittees for intensive flowcharting and analysis to identify the root causes.

Search for solutions

In many cases, the subcommittee is empowered to fix the problem itself, perhaps by streamlining or automating a process to reduce the chance of error. In other cases, where the problem falls outside the IS panel's realm or requires an investment in hardware or software, the subcommittee makes a written recommendation to upper management.

The team approach has cut abends by 66%, while the number of batch jobs has increased, according to IS director David J. Morgan. He says the city saves roughly $1,000 for every abend that is fixed.

Furthermore, the hard data generated by the committee can be mighty useful when it comes to budget justification. For example, committee figures on the high number of problems associated with magnetic tape reels made it easier to justify an investment in tape cartridges, Morgan notes.

But the process is not without pain. After all, it is not much fun to sit around discussing problems when you are staring at a list naming the people responsible for the errors.

One of the committee's guiding principles is that the goal is process improvement, not assigning blame. With that in mind, the committee last year scrapped the "responsible party log" both to reinforce that philosophy and encourage open discussion, says Patricia Rosga, productivity center manager.

Armed with statistics and graphs, the committee can spot trends (see chart) and track their progress toward eliminating the internal problems that can degrade service to its customers. The IS department supports such city services as police and fire protection, water service, housing, parks and recreation, health services and building inspections.

IS director *David J. Morgan: the quality team helps with budget justification*

Representative group

Even more important than the stats is the cross-functional makeup of the committee, Rosga says. There is a representative from each of the three application programming divisions, as well as from systems programming, database administration and quality assurance. Rounding out the team are the operations manager, data control manager and security administrator.

The value of getting all these people in the same room and talking about fixing problems is enormous, Rosga says. In many IS departments the operations and programming divisions are worlds apart, she says, yet only by working together can they trace processing errors to their root causes.

"Our profession attracts people who like to accomplish things but who are not comfortable communicating with each other," Rosga observes. So to foster more team spirit, the committee goes on a one-day retreat to "celebrate our successes" and establish three major goals for the coming year.

Seems too obvious

The quality process in Dallas is not flashy; in fact, it seems so basic that one wonders why it is not standard operating procedure in every IS department.

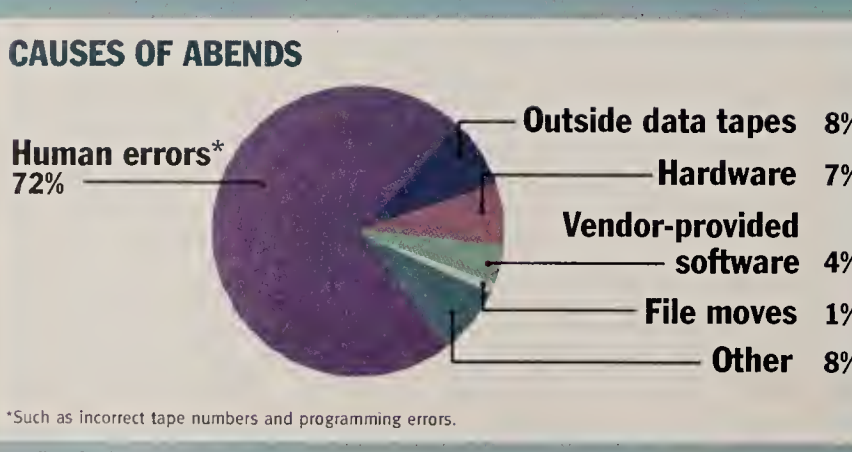
"This is definitely a meat-and-potatoes process, but they have gotten a lot of mileage out of it due to their discipline and organization," says Beth Layman, a software quality consultant.

Many IS departments fail to take these seemingly obvious steps because "they have not truly embraced the team approach and resort to finger-pointing instead of problem-solving," concludes Layman, who runs the awards program at the Quality Assurance Institute.

The nonprofit institute based in Orlando, Fla., promotes quality in information technology organizations through benchmarking, conferences, research reports and certification of quality analysts. ■

The Dallas IS quality team can measure its progress with charts like these:

*During this period, the number of batch jobs increased from 111,879 to 137,279.



*Such as incorrect tape numbers and programming errors.

Source: City of Dallas Department of Information Services

DOD wins for innovative software quality team

Dallas won the 1994 quality award in the "best practice" category, but it was a software support unit of the mammoth U.S. Department of Defense that won in the category of most innovative idea.

The unit, called the J6 Directorate of the U.S. Strategic Command, surely has one of the most critical missions of all: It writes and maintains the software for managing Air Force and Navy strategic conventional and nuclear weapons.

The J6 Directorate won its award for having a team of software process-improvement specialists who have "consultations" with programming teams. The goal: to help them up the ladder of the Software Engineering Institute (SEI) Capability Maturity Model, which identifies the level of quality that a software engineering organization has attained.

Some J6 programming units are near the bottom of the model's ladder; others have risen to Level 2 and are approaching Level 3. The J6 software process group tracks its progress, identifies weaknesses, recommends new tools and sponsors training to help the programming shops reach the next step on the SEI maturity ladder.

The entire consultation process is well-documented with standardized checklists, feedback reports and metrics. Since the consultations began in 1991, the team has been able to track not only upward progress on the SEI ladder, but also reduced error rates in the applications supported by various programming groups.

—Mitch Betts

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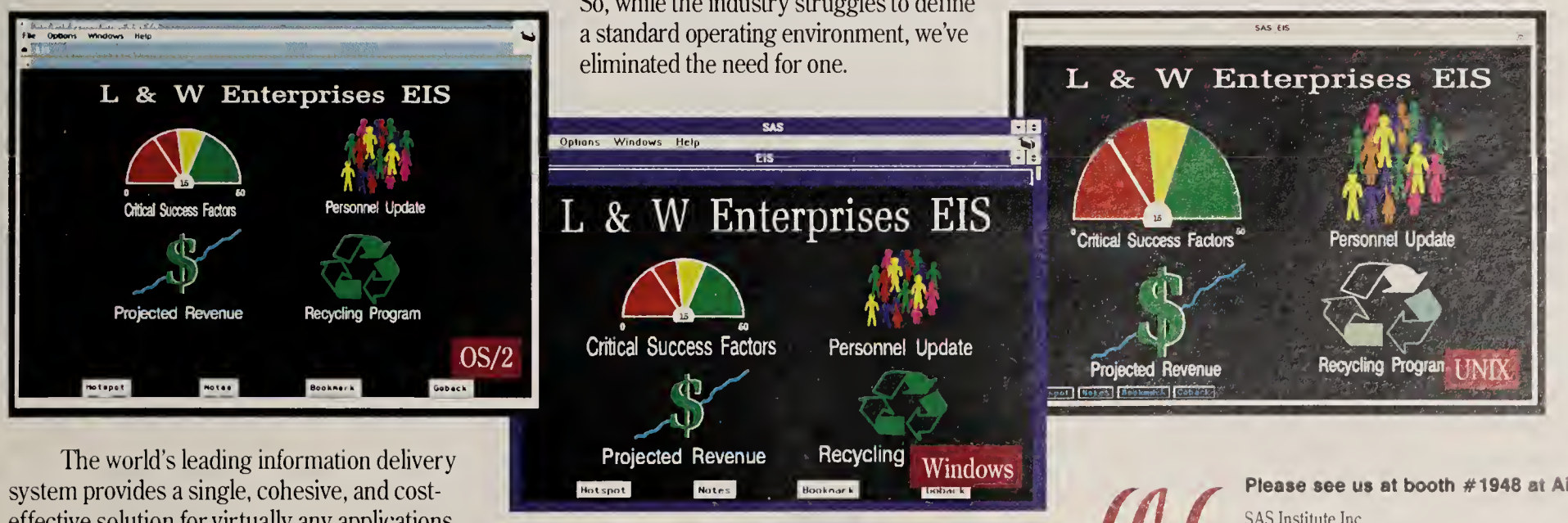

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Intelligence Files

On the road to quality

How do you keep your organization on the road to quality success and avoid becoming a fatality along the way? Start by working with suppliers that have their own successful initiatives; put reward and award programs in place for your employees; and offer quality guarantees to your customers.

Those are a few of the findings on what makes a quality-driven company successful, from a recent survey by Price Waterhouse of more than 1,700 organizations in the U.S. and Canada.

The study, titled "A Program to Understand Leading Practices In Business Survival and Excellence," found that 83% of the companies responding had a quality initiative in place, and more than 70% believed it to be either "very or somewhat" successful. Companies that had been at it for more than two years were generally more satisfied than those that had initiatives in place for less than two years.

The companies with less successful quality initiatives were found to have not followed one or more of the above guidelines.

Source: "International Customer Service Issues," by Stanley A. Brown, Price Waterhouse.

Those in the know don't miss this show.

If you're interested in the business applications of emerging technologies, you won't want to miss TECHNOLOGY EDGE. Every week you'll find information technology and business leaders discussing the key issues they face in using technology to improve competitiveness.

Prior topics discussed have included *Reengineering the Corporation, Downsizing, Networking* and *Videoconferencing*. And guests have included people like Patricia Wallington, CIO of Xerox; Bill Gates, CEO of Microsoft; Bill Caffery, VP of the Gartner Group; and Jack Telnack, Director of Worldwide Design Operations of Ford.

TECHNOLOGY EDGE is brought to you by Sequent Computer Systems, every Saturday from 5:30 to 6:00 PM EST on CNBC Cable. Check your local listings or call 1-800-SMART-TV for the time and cable channel in your area.

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Reporter's Notebook

From the CIO *magazine conference "Re-visioning IT: Achieving an Enterprise Perspective," held March 13-16 in Orlando, Fla.*

Make 'em laugh or else

Hal Rosenbluth of **Rosenbluth International** added another item to the list of how CIOs lose their jobs: No one is laughing. It seems that more than a year ago, the travel services mogul sacked his CIO after noticing a lack of laughter during one of his walks through the IS department. To Rosenbluth, the sound of silence meant something was rotten in the IS department. After further investigation, he concluded that employees were unhappy and that little was getting done. Rosenbluth is author of "The Customer Comes Second," wherein he states that the secret of excellent customer service is keeping your employees happy.

Lot of hiring going on

AT&T isn't the only telecommunications company that's hiring CIOs left and right. Ralph J. Szygenda, Bell Atlantic's CIO, said he is in the process of hiring CIOs for the baby Bell's business units. Szygenda said he has interviewed 55 CIOs during the past eight months.

Cheaters never prosper

About 5% of candidates for CIO positions lie about having an MBA — usually from **Harvard Business School**, according to John L. Sullivan Jr., a managing director in the Boston office of **Korn/Ferry International**, an executive recruiting firm. But telling tales out of school is a sure way to abort your bid for IS chiefdom. Any decent recruiter can find out if you really are an MBA program graduate faster than you can say "pahk your cah in Hahvahd Yahd." And none will represent a candidate who has lied so brazenly. *—Allan E. Alter*

Executive Track

Rick Swanborg is leaving **Ernst & Young**'s Center for Business Innovation in Boston to join **Trade Winds**, a new consultancy in Cambridge, Mass., as managing director and COO. He had run Ernst & Young's IS leadership program, which has been closed. Trade Winds will focus on information technology strategy and helping IS organizations redesign themselves.... David Passmore, late of **Gartner Group, Inc.** and **Ernst & Young**, has started a firm called Decisis, Inc. in Herndon, Va. It will focus on networking and IS architecture consulting.

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Instead of learning new Windows programs, why not let them teach you? We have "Coaches" to show you how things work. Plus "Experts" and "Macros" that perform complex tasks for you. So you don't have to learn anything at all.

The Desktop Application Director lets you access applications and common tasks at the click of a mouse.

Our Transition Advisor can even teach you the new key commands. Or we can make your WordPerfect® menus and commands exactly like DOS.

Help sharing.

Unlike other suites, every product in the Borland Office is workgroup-ready right out of the box. So you can share information with your co-workers and receive updated data without any additional hardware or software.

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Calendar

APRIL 24-30

Computer Human Interaction (CHI) '94: Association for Computer Machinery Conference. Boston, April 24-28 — Focus: "Human Factors in Computer Systems." Contact: ACM, New York, N.Y. (212) 869-7440.

VIP '94. San Antonio, April 24-28 — Legent Corp.'s annual users' conference. Open to all users of Legent products; designed for managers and professionals at all levels. Contact: Legent Corp., Herndon, Va. (703) 708-3000.

The 24th Computer Audit, Control and Security. Dallas, April 24-29 — Contact: Sara S. Patterson, The EDP Auditors Association, Rolling Meadows, Ill. (708) 253-1545.

Investment and Finance Strategies for Small High-Tech Companies. New York, April 25 — Also in Boston on May 2, Raleigh-Durham, N.C., on May 9, Chicago on May 16 and San Jose, Calif., on May 23. Contact: Paula Ungurcanu, International Association of Knowledge Engineers, Gaithersburg, Md. (301) 948-5390.

ServiceTrends '94. Boston, April 25-26 — The 11th Annual Conference for Senior Service Executives. Theme: "The Service Revolution: Your Key to the New Information Technology Industry." Featured speakers include Jim Champy, president of CSC Consulting Group, who will offer a "view from the top," sharing his insight and expertise in positioning and marketing value-added services; and James Manzi, president and CEO of Lotus Development Corp. Contact: Dataquest, Inc., Framingham, Mass. (800) 457-8233.

First Annual Conference on Mass Customization. Dallas, April 25-27 — Keynotes: Stan Davis, author of *Future Perfect*; and Joseph Pine, author of *Mass Customization: The New Frontier in Business Competition*. Contact: Management Roundtable, Boston, Mass. (617) 232-8080.

Patricia Seybold's 1994 Technology Forum. Cambridge, Mass., April 25-27 — Focus: Designing enterprise client/server applications using distributed objects. Contact: Patricia Seybold Group, Boston, Mass. (617) 742-5200.

26th Annual Information Systems International Conference. Atlanta, Ga., April 25-27 — Theme: "Adding Value Through Information Systems." Keynote: John P. Imaly Jr., chairman of Dun & Bradstreet Software, will present "From Computing Power to Competing Power." Contact: Cathy Todd-Moffat, Paper Industry Management Association, Arlington Heights, Ill. (708) 956-0250.

CIO Leadership Skills for the Era of Healthcare Reform. Ann Arbor, Mich., April 25-29 — Contact: College of Healthcare Information Management Executives, Ann Arbor, Mich. (313) 665-0000.

Let's get Hammered

You've successfully completed a re-engineering project and lived to tell the tale. Now you're ready for the real test — re-engineering round two: the whole organization.

You can get tips from the top on how to survive this ultimate next step from re-engineering guru Michael Hammer. He will host three days of radical re-engineering tips, techniques and case studies at Re-engineering/Hammer Forum & Clinic '94, which will be held May 11-13 in Boston.

Michael Hammer

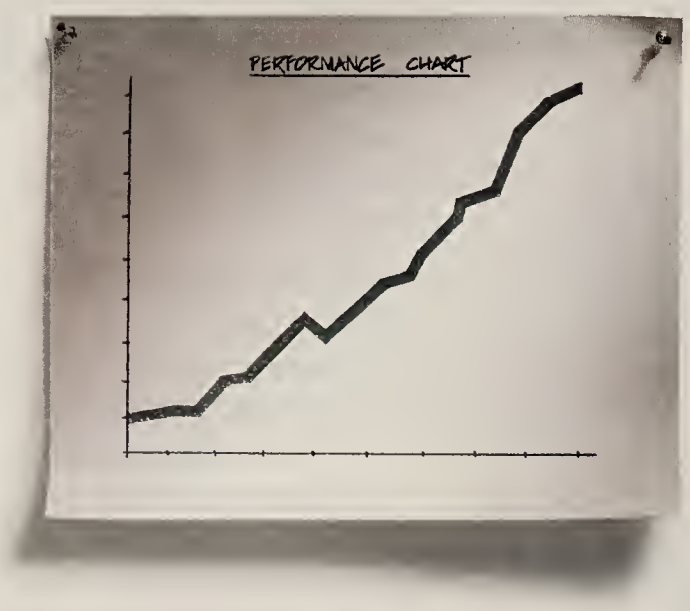
The theme for the conference will be "Large-Scale Re-engineering: Reinventing the Entire Enterprise — A Landmark Conference on the Next Wave of Re-engineering." Hammer and others will discuss how to take your company through "the second act of the re-engineering drama" and make it great so it will not disappear as the 21st century approaches.

Participants will focus on re-engineering their organization's operating processes, reshaping the corporate culture and transforming their human resources for a new work environment.

The Hammer Forum will include speakers from companies engaged in major re-engineering projects. The Hammer Clinic will have sessions led by Hammer, Steven Stanton of Hammer and Co. and Noel Tichy of the University of Michigan.

The conference and clinic will be held at the Mariott Long Wharf Hotel in Boston. For information, call Hammer and Co., Cambridge, Mass. (617) 354-5555.

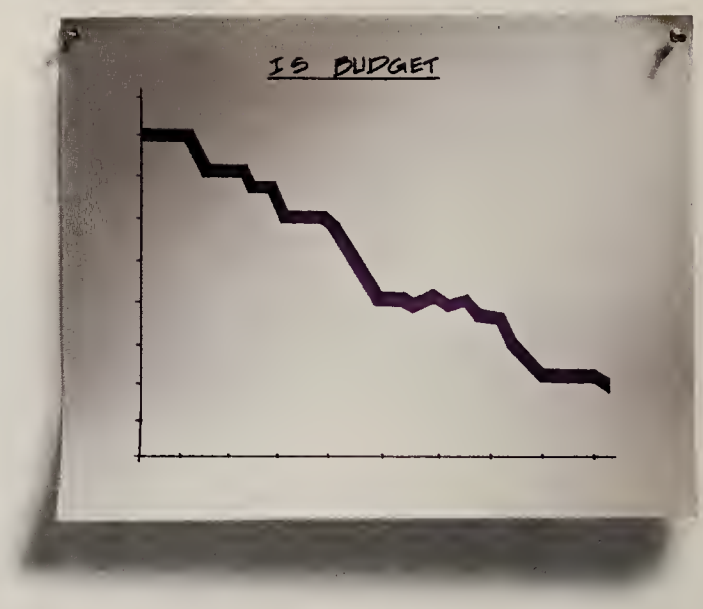
Your Boss's Expectations



The executive committee has decided that your company's key to sustainable competitive advantage is a flexible information system — one that can speed up your processes and let you react quickly to change. Unfortunately, they've also decided to cut your budget.

Most likely, this leaves you with a mainframe system that can't fill the bill and an accounting department that won't take kindly to larger monthly bills.

Your Budget



Of course, most members of today's executive committees have read an article or attended a seminar touting the wonders of economical mainframe alternatives and flexible client/server databases. So the answer probably seems simple — to them. But you've got to make it all work in the real world.

It's time to call in the team that knows how to do just that: Oracle and Hewlett-Packard. We've been developing products jointly for years — so you can be sure our systems work together for optimal performance and

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Image World Expo. Chicago, April 25-29 — Focus: The five-day event will combine exhibits, seminars, general sessions, workshops, conferences and master classes. Contact: Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

The 1994 Data Center Baseline Update Conference. Boston, April 26-27 — Contact: Danielle Dawson, The Weber Group, Cambridge, Mass. (617) 661-7900.

35th Annual Technical Conference of the American Design Drafting Association. Seattle, April 26-29 — Contact: Rachel Howard, American Design Drafting Association, Rockville, Md. (301) 460-6875.

Vision '97. Scottsdale, Ariz., April 27-29 — Focus: A comprehensive vision of document technology addressing customer needs through 1997. Contact: Xplor International, Torrance, Calif. (310) 373-3633.

1994 Association for Engineering Manufacturing Excellence Executive Conference. Chicago, April 27-29 — Keynote: Samuel Skinner, president, Commonwealth Edison Co. Contact: Ruth-Anne Atkins, Association for Engineering Manufacturing Excellence, Phoenix, Ariz. (602) 224-0447, Ext.104.

Information Technology Association of America (ITAA) Software & Services Conference. San Francisco, April 27-30 — Contact: ITAA, Baltimore, Md. (703) 284-5355.

The Computer Bowl All-Star Game. San Jose, Calif., April 29 — Created by the Computer Museum and presented by the Association for Computing Machinery, this ultimate contest of computer smarts between East and West Coast industry leaders pits the most valuable players of all five previous bowls against one another. Contact: The Computer Museum, Boston, Mass. (617) 426-2800.

Executive Forum. San Diego, April 29-30 — Senior software support executives will join forces with CIOs and MIS directors from business and industry for an in-depth look at customer support from a business perspective. Featured speaker is Jim Clemmer, writer and speaker on organizational improvement. Contact: Software Support Professionals Association, San Diego, Calif. (619) 674-4864.

Second Annual Technology and Tools Conference. Somerset, N.J., April 29-May 1 — Contact: Arthur J. Gaynor, DPMA Empire Region Conference, New York, N.Y. (718) 990-7679.

MAY 1-7

Fifth Annual Rexx Symposium. Boston, May 1-4 — Mike Cowlishaw, who is the author of the Rexx language, will speak along with the implementors for Rexx versions on DOS, OS/2, Unix and all IBM systems. Contact: Cathie Dager, Stanford Linear Accelerator Center, Stanford, Calif. (415) 926-2904.

Business Forms Management Association Symposium. Ottawa, May 1-5 — Keynotes: Presentations will feature John Landry, senior vice president of software development at Lotus Development Corp.; Keith Davidson, executive director at Xplor International. Contact: Business Forms Management Association, Inc., Portland, Ore. (503) 227-3393.

First Annual PowerOpen Conference. Boston, May 3-4 — Contact: PowerOpen Association, Burlington, Mass. (617) 273-1550, Ext. 7107.

Midrange Expo. Boston, Mass. May 3-4 — Contact: National Productions, Inc., Salem, Mass. (508) 745-6010

CUMREC/CAUSE Workshop. Columbus, Ohio. May 4-5 — Sponsors: CUMREC is the College and University Computer Users Association, and CAUSE is the association for managing and using information technology in higher education. Contact: CAUSE, Boulder, Colo. (303) 449-4430.

Spring 1994 Electronic Imaging Seminars of Choice. Los Angeles, May 4-5 — Contact: Cohasset Associates, Inc., Chicago, Ill. (312) 527-1550.

1994 Spring Congress. San Francisco, May 4-7 — Theme: "Medical Information and Record Systems Integration at the Enterprise and Individual Levels." Contact: American Medical Informatics Association, Bethesda, Md. (301) 657-1291.

1994 Computer Law Update. Washington, May 5-6 — Contact: Computer Law Association, Fairfax, Va. (703) 560-7747.

DECUS '94. New Orleans, May 7-12 — Focus will be on "Managing Complexity — Succeeding in a Multivendor, Multiplatform World." Contact: Digital Equipment Computer Users Society (DECUS), Shrewsbury, Mass. (508) 841-7166.

MAY 8-14

Meeting The Global Challenge. Anaheim, Calif., May 8-10 — Contact: Beth Bolog, National Center for Manufacturing Sciences, Ann Arbor, Mich. (313) 995-7962.

Conference On Interactive Marketing/East. Orlanda, Fla., May 8-11 — Focus: Anatomy of an interactive deal, interactive telephone, on-line services, interactive advertising, video games, new interactive cable networks and more. Contact: Interactive Marketing, Inc., Los Angeles, Calif. (310) 473-4147.

Enterprise PC. Carlsbad, Calif., May 8-11 — Focus: "Desktop Strategies for the 90s." Sponsored by *Information Week* and Technologic Partners. Contact: Technologic Partners, New York, N.Y. (800) 869-6963.

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cus·tom·er·ize \ kŭs'-tə-mə-rīze' \ *vt* **1:** to make a company more responsive to its customers and better able to attract new ones **2:** to customerize an organization's information strategy, e.g., to extend systems capabilities to field locations and other points of customer contact and support **3:** what Unisys Corporation does for a growing roster of companies, and government agencies, worldwide ***syn*** see CUSTOMER SERVICE, COMPETITIVE EDGE, BUSINESS-CRITICAL SOLUTIONS, REVENUE GENERATION

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STAN GAZ

AI BURNOUT

By 1993, "AI" was a dirty word. The AI industry was shook up, shaped up and scaled down. Yet it still managed to get some big corporate successes under its belt.

By H. P. Newquist

The largest single year of artificial intelligence corporate revenue, 1988, reached a level of approximately $1 billion.

In contrast, the amount of money spent on cat food in the U.S. that same year was in excess of $2 billion.

The business that was planning to change the world had never put its own importance into perspective relative to the other concerns of the world. Looking at these numbers might have helped.

By 1993, only three of the earliest expert system companies managed to

AI burnout, *page 133*

David Eisenlohr
Computerworld Reader Since 1981
VP, Telecommunications
The Pacific Stock Exchange

In the information market, this much is clear: Vendors make the products. IS managers make the decisions.

When The Pacific Stock Exchange went shopping for new intelligent hubs, they knew exactly what they wanted; drop-dead reliability, top-notch quality and true affordability. In precisely that order of importance. After all, the new hubs would be the central core of the entire trading system. In short, they may be high rollers, but they aren't willing to gamble.

And no one is better suited to bring them together than we are. Another match made by Computerworld.

Not surprisingly, they put their futures in Cabletron. Not only were they a cost-effective and high quality option, Cabletron's hubs offered the most important feature of all; rock-solid reliability. Is the Pacific Stock Exchange pleased with their hubs? Well, let's just say they wouldn't trade them for anything in the world.

Bob Levine
Computerworld Advertiser
Since 1990
President & CEO
Cabletron Systems, Incorporated

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OPENVISION.

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AI burnout

CONTINUED FROM PAGE 129

emerge from the wreckage of the AI business — Inference Corp., Carnegie Group, Inc. and Neuron Data, Inc. They no longer called themselves AI companies, nor did they refer to their products as AI products. Instead, they sold their goods and services using less threatening terms such as "knowledge management tools" and "re-engineering software" and "intelligent development environments."

Inference found that many of its clients were using its tools to create help desk systems.

Intelligent help desks, which were basically expert systems, allowed the customer service representative to input the customer's questions or problems into a computer system, which would then search its knowledge base to find the correct solution. This saved time, and the system was usually more efficient than the humans who couldn't possibly remember all the types of problems that occurred in huge product lines.

Having these smart assistants reduced phone time and improved customer satisfaction.

Companies ranging in diversity from Nintendo of America, Inc. to Compaq Computer Corp. to Color Tile all installed intelligent help desks and were more than happy to talk about them. After all, these expert systems were tangible manifestations of their desire to serve the customer better.

PRIORITIES

AI revenue, 1988 (largest single year)
$1 BILLION

U.S. cat food revenue, 1988
$2 BILLION

Carnegie Group continued to develop specific applications for its strategic investors, especially Ford Motor Co. and US West. In Ford's case, Carnegie created the Service Bay Diagnostic System (SBDS). This system addressed the problems with dealer servicing of cars still under warranty.

Due to the increasing complexity of newer model car components, many auto technicians or mechanics were finding it easier to swap out entire auto subassemblies rather than find a specific component that needed to be repaired. Thus, a subassembly consisting of numerous components, instead of an individual component, was thrown away, even when much of the subassembly was in working order.

This increased the cost of warranty repair to Ford because the cost of all the parts was passed to the automaker by the dealer.

Ford wanted to have more detailed repairs carried out with fewer parts returned, thereby holding warranty expenditures down. The idea behind the system was to put a PC with a 20,000-rule diagnostic expert system in every dealership service bay and to have it guide mechanics through the diagnosis and repair procedure. This way, a more precise repair could be made, eliminating the wholesale swapping out of parts.

It also minimized the time it took for the repairman to find the problem, which meant the customer got the car back sooner, which in turn meant Ford looked better when it came time to publish the latest J. D. Power and Associates satisfaction ratings. And since the engines on new cars were beginning to look like the inner workings of a supercollider, the system assisted mechanics in staying current with changes in automotive design.

An interesting aside to this project was that the Carnegie developers discovered an unusual fact about auto mechanics: A significant proportion of them were dyslexic. This prevented those mechanics from getting more skilled

AI burnout, *page 135*

It actually works!

AI breaks through in real-world apps

By H. P. Newquist

By the end of the 1980s, keeping out of sight was a way for most artificial intelligence companies to take a deep breath and figure out just what the hell they were going to do with themselves. Many of them reorganized. Many of them rethought their product strategies. Many of them just wanted to crawl off into a corner and die in peace.

AI USER PROFILES

The timing of all this was somewhat inopportune. As the AI vendors were giving up the ghost, their customers were coming out of the closet. The expert systems that had been such a big secret for years in large corporations were now proving their usefulness.

American Express

Senior executives at American Express Co. were convinced AI had the potential to help the company to improve some of its operations. One of these executives was Lou Gerstner, who would eventually replace John Akers as head of IBM.

Gerstner and several other managers believed that AI could be applied to the company's largest business, its credit-card division. Specifically, they felt the authorization of credit-card purchases, a very time- and people-intensive process, could be handled by some form of AI.

The criteria for an "authorizer's assistant" were fairly straightforward. It had to minimize fraud and credit losses from improper or incorrect authorizations. It had to assist authorizers in making more accurate authorizations more frequently and more quickly.

The first prototype took almost six months to complete and consisted of 520 rules (over the years, it has grown to more than 1,000 rules). The Authorizer's Assistant was transparent to Amex's users, who still utilized the same IBM terminals and system software that were in place before the expert system project began. For them, it appeared as if the regular system had just taken on a new level of intelligence.

The regular system, however, was linked into a network of Symbolics, Inc. machines that were responsible for running Inference Corp.'s software. There, authorization decisions were made and sent back to the mainframe, which then returned the approval or disapproval over the phone lines to the original merchant and card holder.

American Express claimed it saved tens of millions of dollars per year using the Authorizer's Assistant. It did the work of 700 authorization employees, many of whom were transferred to other, less routine job functions.

Coopers & Lybrand

Coopers & Lybrand wanted to apply AI technology to the difficulties it encountered in keeping up with the escalating changes in the corporate tax code. The majority of auditors were not able to embrace

AI user profiles, *page 135*

From whence the money came

Corporate America's investment in AI hit its highest point in the four-year span from 1983 to 1987, amounting to more than $50 million. When you include the amount of venture capital money spent, total AI equity investment hit well over $100 million.

Teknowledge

- **$4.1 million** from General Motors
- **$4 million** from Procter & Gamble
- **$3 million** from Nynex
- **$3.2 million** from FMC

Carnegie Group

- **$1.6 million** from Boeing
- **$2 million** from Digital
- **$5 million** from Texas Instruments
- **$6.5 million** from Ford Motor
- **Undisclosed sum** from US West

Inference

- **$6.5 million** from Ford
- **$6 million** from Lockheed
- **Undisclosed sum** from Control Data

Lisp Machine, Inc.

- **$5 million** from General Signal
- **$4.5 million** from Raytheon
- **$500,000** from Texas Instruments
- **Undisclosed sum** from Control Data

Kurzweil Applied Intelligence

- **$2.5 million** from Xerox
- **$1.5 million** from Wang Laboratories

Others

- **$1 million** (estimated) from The Travelers into Applied Expert Systems
- **$2 million** from Microsoft into Natural Language
- **Undisclosed sum** from Texas Instruments into Brattle Research
- **Undisclosed sum** from US West into Syntelligence
- **Undisclosed sum** from Control Data into Software Architecture & Engineering

Source: *The Brain Makers* by H. P. Newquist

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AI burnout

CONTINUED FROM PAGE 133

engineering jobs. To address this, Carnegie created an intricate natural language front end to SBDS to make the system more accessible to Ford's mechanics.

Neuron Data, for its part, designed its software tools so they could be invisibly embedded in other applications. A programmer using Neuron Data products could create a new program, such as a job scheduler, and easily insert rules or objects into that program without having to connect it to an outside expert system.

The ease with which Neuron Data's products could be integrated into the programming process made it extremely popular with developers, and Neuron Data became the biggest seller of AI-based tools, boasting more than 10,000 licenses for its product line.

Companies such as Microsoft Corp. and the major database vendors started offering AI facilities in their products, although they didn't dare call them AI facilities. Microsoft embedded Inference's case-based reasoning technology into its Windows NT development environment to provide intelligent user assistance to developers.

Other companies also started offering facilities that enabled programmers to build mini expert systems directly into their basic code.

Eventually, all programs will have this intelligent capability. None of us will think anything of it because machine intelligence will become pervasive and even expected. Thus, the ashes of the AI industry's burnout are not destined to rise like the phoenix. Instead, they have already seeped into the ground water, where they have permeated the mainstream of computing and have now started filtering into everyday applications. ■

AI user profiles

CONTINUED FROM PAGE 133

all these changes because they worked in the field. Thus, they relied on experts within the company to assist them in working through thorny issues relating to the mutations in the tax structure.

Coopers & Lybrand decided to develop a computerized method of assisting with the corporate audits.

This particular project had to achieve several important goals: reduce the time spent between the start and finish of a complete audit, achieve that goal by reducing the time needed for each individual audit step, reduce the time required for using high-level managers and audit experts and ensure that the quality was consistent with that achieved by Coopers & Lybrand's own internal experts.

Over the course of 1986, roughly two dozen experts contributed more than 1,000 hours of time to the creation of ExperTax. The result was that Coopers & Lybrand spend almost $1 million on the development of ExperTax, based in large part on the number of hours needed from high-level experts.

All 96 Coopers & Lybrand's U.S. offices were then set up with the system. Thus, Coopers & Lybrand had 96 computer clones of its experts installed in each office, all of which could now produce consistent and sophisticated tax strategies.

Johnson Wax

The maker of Raid and other insecticides used Aion Corp.'s expert system shell to develop an application, called REGI, that helped the entire company wade through the product regulation maze. The system, developed in roughly six months, contained knowledge about all federal and local insecticide regulations and helped outline product requirements in order to meet these mandates.

A significant number of product application rejections were routinely based on clerical failings in filling out the applications, and Johnson believed that REGI kept this out-of-hand rejection percentage to less than 10%. ■

All material is taken from *The Brain Makers* by H. P. Newquist. Copyright 1994 by Sams Publishing. Reprinted by permission of Prentice Hall Computer Publishing, a division of Simon & Schuster, Inc. Newquist is a Scottsdale, Ariz., writer who has covered the artificial intelligence business for more than a decade. He has been a frequent columnist for *Computerworld*.

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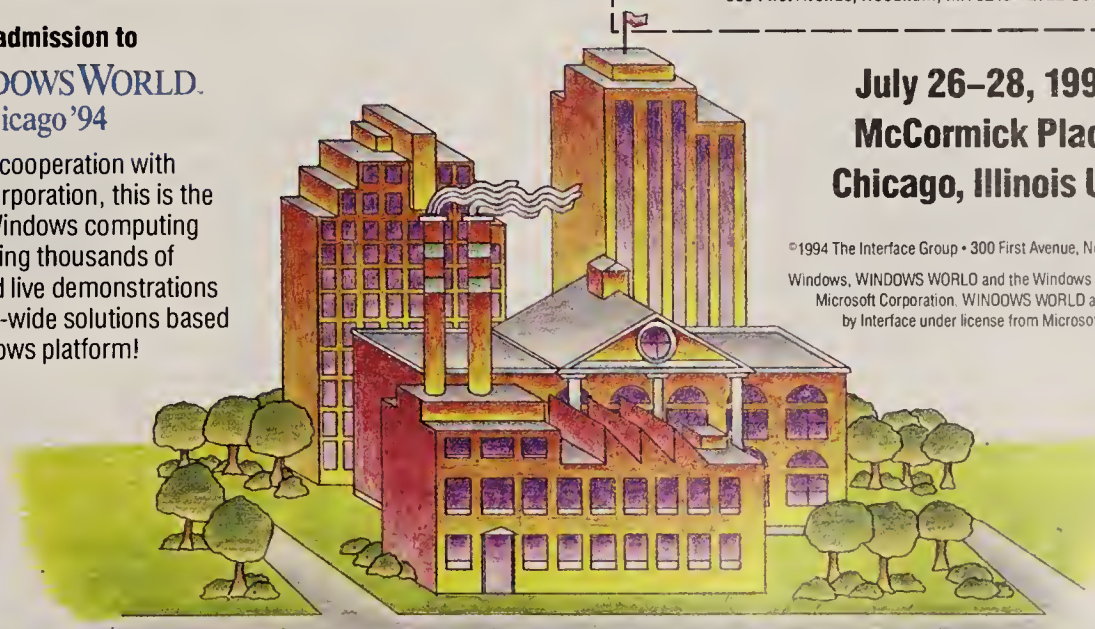

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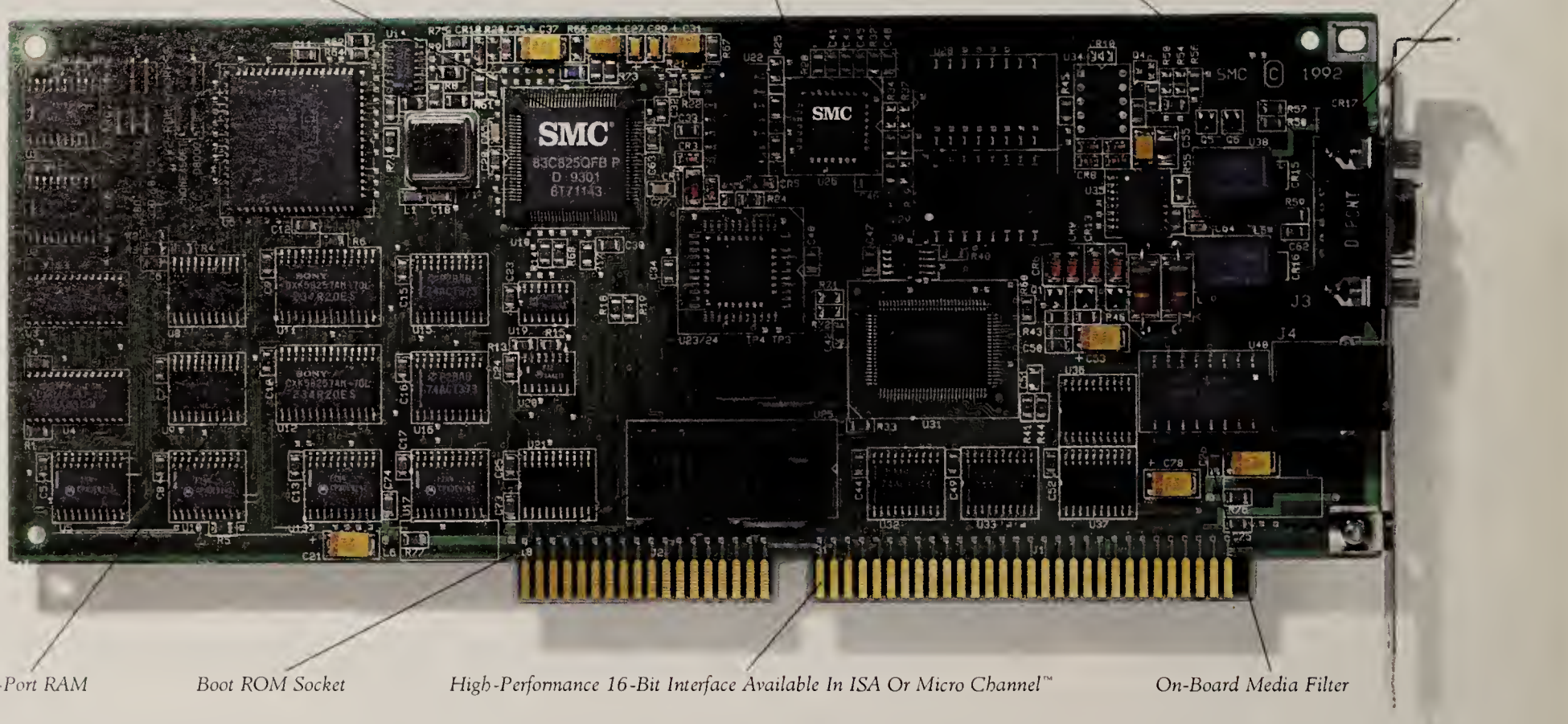
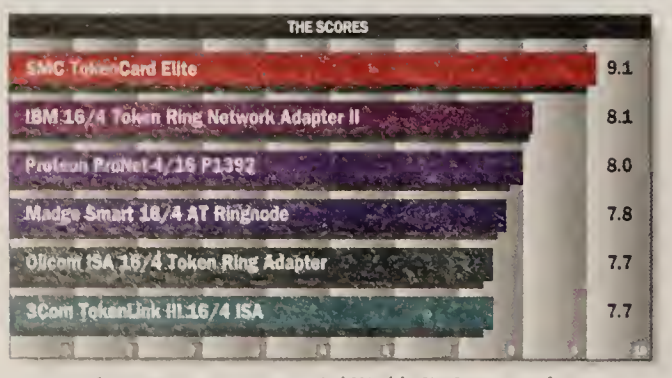


There's a new leader in Token-Ring Technology.

In June 1993, InfoWorld tested the top Token-Ring adapters for speed and flexibility. Guess who came out on top?

Not IBM, Madge or Olicom. But SMC. The review stated: "Not only did the SMC TokenCard Elite™ offer overall excellence (with excellent or very good scores in every category), it stood out for being among the easiest to install."



In a recent comparison in InfoWorld, SMC came in first.

The SMC TokenCard Elite is 100% interoperable within IBM environments. It's also fully compatible with both IBM and IEEE 802.5 Token-Ring standards, fully software configurable, and backed by a lifetime warranty. You get lots of extras, too. Like free SNMP management.

But the story doesn't end there. SMC is not only the technology leader but also the low price leader.

In fact, with an incredible new price of $249 in a 50-pack, and only $299 for a single card, the SMC TokenCard Elite is priced far lower than any other Token-Ring adapter.

With SMC Token-Ring products priced 50% lower than typical solutions, that can translate into a savings of over $35,000 per 100-node installation. Without your having to sacrifice quality, reliability or peace of mind.

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EZStart™, SMC's new Windows-like auto-configuration and test utility, makes installation and troubleshooting a snap.

In fact, according to independent network testing laboratory LANQuest Labs, EZStart is "head and shoulders above the others."

In the unlikely event you'll need it, you're also guaranteed the service and support of a company that's been in business for 23 years and has over 6 million nodes installed.

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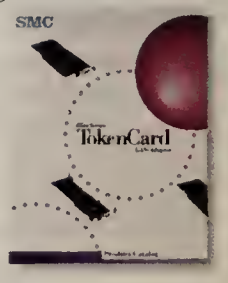

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FIRST THINGS FIRST when building objects

NEED to know

By Sally Cusack

Companies are embarking on object-oriented development projects, and most experts agree that object technology is the next logical evolution of client/server. In receiving a lot of attention, object development has proved it can deliver on its promises of flexibility and the capacity to create reusable code.

Sounds great on paper, right? But just how do you go about defining which entities should be modeled as objects within the corporation?

According to Steve Clampett, senior vice president at AADT Corp. in Fort Worth, Texas, the first priority is making sure all members of the development team understand the business process and the problem. "We reinforce that over and over again. Sometimes we literally follow the executive around."

AADT, a wholly owned subsidiary of AMR Corp., was asked to develop a tool for American Airlines that would allow executives to effectively analyze and use current market and customer data. The application also required sophisticated graphical user interfaces that could be shared and reused.

According to Clampett, defining needs and modeling them as objects resulted in a tool that gave decision makers access to volumes of standard data residing in a variety of different repositories. Clampett cautions, however, that successful object modeling requires developers to be steered away from procedural methodologies. "They must understand the business environment, the object and how they interact," Clampett says, stressing that it is not important to be right the first time but to be iterative in the approach.

Retail opportunities

Jim Stikeleather, a partner at Technical Resources Connections, a consulting firm based in Clearwater, Fla., sees a natural fit for object modeling across many industries.

While object modeling is a natural fit for things such as assembly line production and the shop floor, retail may be the next big investor. "Object-oriented [technology] is necessary to support all the micromarketing functions and the huge volume of information retail needs," Stikeleather says. Like the travel industry, retail must react quickly to market changes.

However, developers and industry experts agree that defining the entities to be modeled is only the first half of the solution. Moving programmers and developers successfully from procedural to object paradigms is the greater challenge.

"You must choose people who are open-minded," says Mary Ellen Sparrow, senior consultant at Semaphore, Inc., a North Andover, Mass., consulting and training firm that specializes in object technology. Sparrow advises that initial object-oriented development teams consist of flexible individuals — people with a C or Cobol background willing to go to C++ or Smalltalk.

Sparrow also suggests embarking on smaller, non-mission-critical projects at first. A pilot project, usually lasting between three and six months, is not that expensive, she says.

Yet the real issues are people issues, Stikeleather says. "Top programmers don't want to become programmer trainees again, and if you're not careful you can end up with frustration and staff turnover." To help alleviate this, Sparrow suggests designating six or seven individuals for the initial training and project and letting them act as mentors for other team members.

Clampett adds a few more qualifiers. Companies should look for developers with experience in client/server and relational database management environments. But most important? "Someone who is going to come in with a business focus," Clampett says. "This is essential when determining object modeling." ■

Cusack is a free-lance writer in Marstons Mills, Mass.

The model strategy

Jeff Donaldson, principal at AADT Corp. in Fort Worth, Texas, and Susan Liscombe, the company's director of product development, offer the following suggestions for companies building and implementing objects:

- Choose people willing to look at a new computing environment.
- Create and enforce an open team environment with lots of communication, white boards and several huddle rooms.
- Use training classes and prepare for a six- to nine-month learning curve.
- Pair mentors with new object developers.
- Choose people with a strong commitment to providing business solutions via iterative design methodology.

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Prep for pre-sales

For a change of pace, check into presales and postsales positions at vendor organizations. Although the travel may be intense, the advantages are worth it.

By Julie Hart

Love technology but hate sitting behind a desk? Then systems engineering may be the career for you. Virtually every hardware and software vendor employs these professionals to help close deals and keep customers happy. Moreover, these positions pay pretty well.

Systems engineering is divided into two areas: postsales, which concentrates on installing and maintaining customers' systems; and presales, which involves acting as the technical liaison between the vendor's sales force and potential customers. Often, the roles are combined.

Generally, most information systems professionals start in postsales because it most closely parallels their current jobs. "Postsales is more of a lateral move," says Frank Kilpatrick, a network consultant at 3Com Corp. in Pleasanton, Calif. Postsales engineers are typically assigned a group of customers and spend their time either talking on the phone, traveling to a customer site or providing support at the site.

Jennifer Olson, for example, a systems engineer/training specialist at Eastman Kodak Co. in Minneapolis, juggles about 10 mainframe, 15 PC and 10 minicomputer customers. "Sometimes I feel like a jack-of-all-trades and a master of none," Olson says. "It would be nice to be a little more focused on one area. I like development, but I still enjoy interacting with customers."

Technical challenge

If you decide to move on to presales, you must understand the market and be able to communicate clearly in formal presentations to all levels, from systems programmers to executive management.

"Presales is a challenge for technical people," says Chris Norton, Auspex, Inc.'s western area systems engineer manager in Santa Clara, Calif. "If you're a self-starter, you can learn technology. Trying to sell a product and be a consultant, however, is more difficult to learn."

At some vendors, presales and postsales are combined. Bill Sahm, a senior systems engineer at Auspex in Chicago, supports about 25 Unix customer sites in three states. Because Sahm handles both jobs, he splits his time among customer installation, support and assisting his partner, an Auspex sales representative. "Both sides complement each other," Sahm says.

When wearing his presales hat, Sahm delivers two to seven presentations to prospective customers each week. Some of these are canned presentations on the product line; others cover how the company fits into the market.

A big difference between IS and systems engineering is the work environment. "There are no baby-sitters on this job," Kilpatrick says. "I rarely see my boss." But that doesn't mean that systems engineering isn't without its time demands or pressures.

As a software developer, Norton worked 40 to 45 hours per week and more when he was nearing a release date. "Now my work hours vary anywhere from 40 to 70 hours," he says. "I certainly worked less before, but I didn't earn as much and I didn't like it as well."

Travel is another price to pay. In some cases, it is local and requires no overnight trips; in others, territories cover multiple states. Olson, who is responsible for presales and postsales in North and South Dakota, Minnesota and Iowa, is on the road up to 70% of the time during the busy season. The rest of the year she averages 30% travel.

"I don't mind," Olson says. "The biggest frustration is that when I'm out of town and one of my customers needs help, I can't be there right away to solve their problem."

Transitional loss

Specific hands-on skills can also be lost in presales positions. "A good deal of people don't realize this," says Joe Warren, a presales systems engineer at Hitachi Data Systems Corp. in San Francisco, who moved from IS into systems engineering 11 years ago. "As a result, they'll have more difficulty getting back to IS if it doesn't work out."

The best part of being a systems engineer, Norton says, is expanded career opportunities. "With my skills, I can cross over into sales, product marketing, engineering or technical support," he says.

"If you just want to sit back and rest on your laurels, [systems engineering] isn't the place to be," Kilpatrick says. "But if you are confident, and you want to be judged on what you do, rather than the whole IS team, you have the potential for great success." ■

Hart is a free-lance writer in San Jose, Calif.

Earning your keep

According to an informal survey, systems engineers with three to five years' experience can take home between **$45K** and **$70K** a year. Five or more years' experience earns them from **$50K** to **$80K**. On top of that, bonuses range from **5%** to **20%**.

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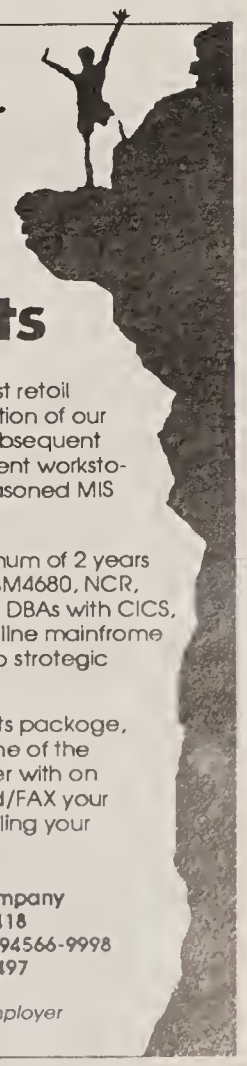

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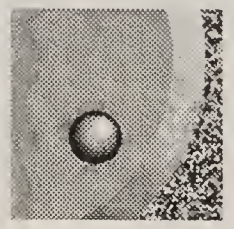

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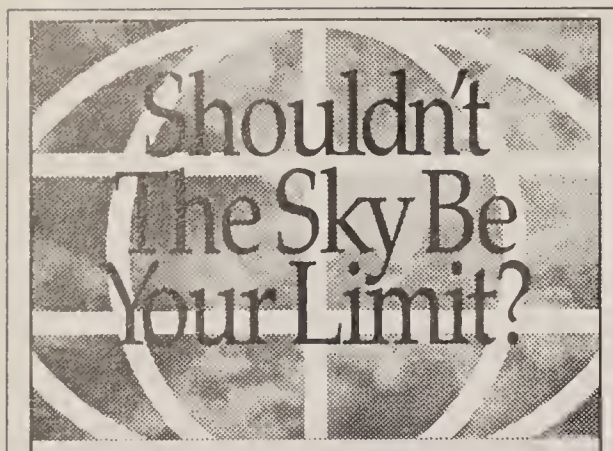

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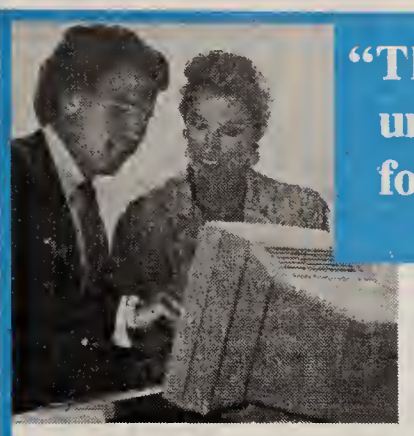

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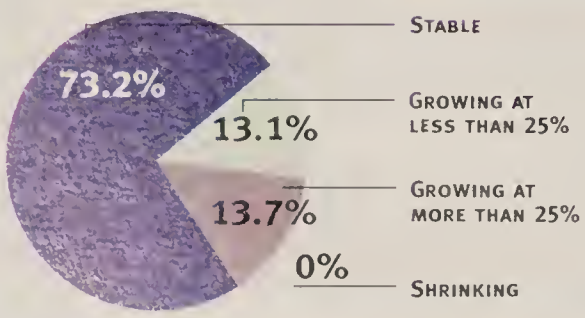

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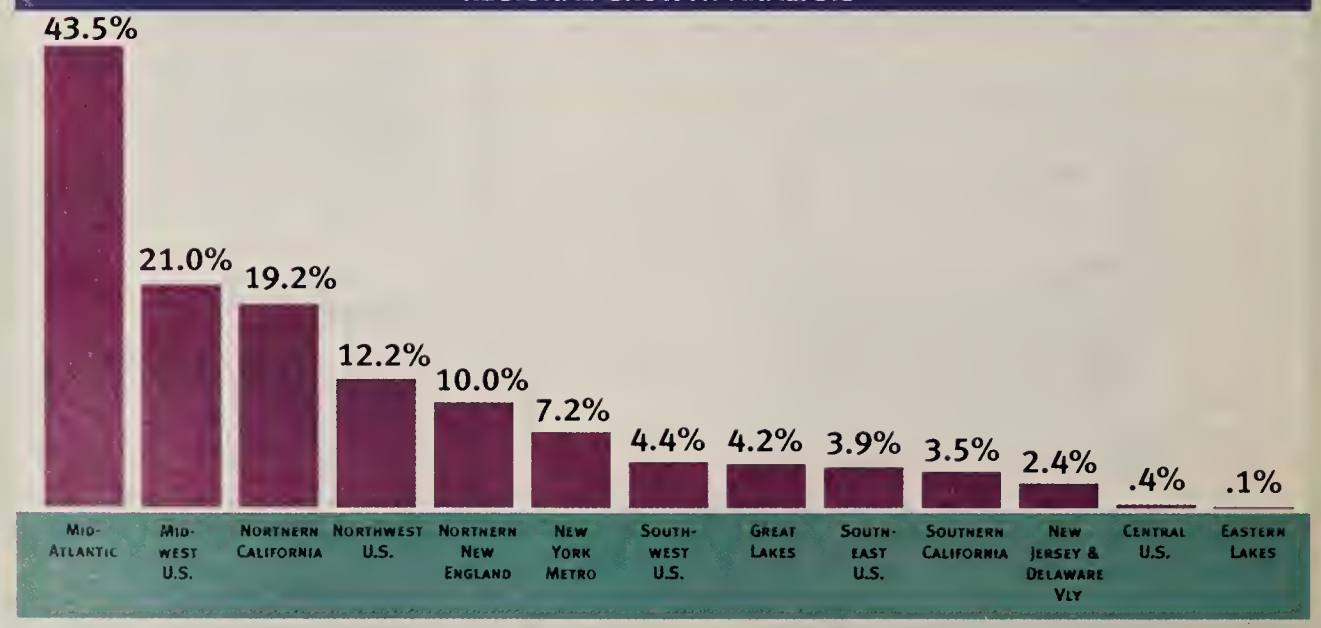

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GREAT GUI!

While graphical user interface building tools come in most shapes and sizes, experts recommend paying attention to a product's level of difficulty, among other things.

By Lee Bruno

When selecting the appropriate graphical user interface (GUI) builder, developers should spend plenty of time comparing features and test-driving products.

Topping developers' wish lists is ease of use, a category in which Visual Edge Software Ltd.'s UIM/X, Integrated Computer Solutions, Inc.'s Builder Xcessory and Imperial Software Technology's Xdesigner are often mentioned.

While ease of use is a subjective quality, experts say if a product's documentation must be opened, the learning curve will be steep. "If you can build the application on the same day you get the tool, it's a good measure of its productivity," says Fred Sells, president of Sunrise Software International, Inc. For Sells, productivity falls into three categories: "How quickly applications can be built, how well they can be maintained and how long it takes to learn the tool."

Consistent style

In today's information systems departments, large software projects are often team-driven, and to maintain consistency in final applications, GUI attributes such as colors, buttons and dialogue boxes must be restricted. Currently, however, few GUI builders claim this capability. One such tool is TeleUse 3.0 from Alsys, Inc., which lets developers design object-oriented widget templates with different screen elements such as menus, buttons and scroll bars that can be reused applicationwide.

At the same time, the tool lets developers hide the encapsulated attributes to selectively control information that is revealed to the user. "One of the big benefits is that we can build templates that are locked with an enforced style guide," says Bob Clark, senior technical staff member at GTE Government Systems Corp. in Durham, N.C. "This allows developers in different parts of the country to comply with the widgets and color palette defined for the project."

Inheritance permits software components to be reused, which lets developers spend less time writing code. Xdesigner 3.0 and TeleUse 3.0 are two GUI builders that generate code in the C++ language.

"Most of the development with respect to user interfaces is defining the behavior," says Dale Adams, principal software engineer at Lockheed Sanders, Inc. in Merrimack, N.H. "The GUI lets users draw things rapidly on screen, but it doesn't have the best mechanism to describe behavior."

TeleUse's scripting language helps users define object behavior in a way that other tools do not. It employs an object-oriented tool that lets users write object-oriented callback scripts that specify, manage and control the dialogue between the user interface and the code. According to Alsys, it takes three days to learn to write these scripts, but experts warn that they may not be usable if a user decides to move to another GUI builder.

Runtime, run costs

Although rare, runtime licenses should be avoided. "These licenses will kick most vendors out of the running with us," Adams says. "We build applications and field them several thousand times so we don't want to be paying runtime licenses."

Runtime licenses are typically associated with tools that support proprietary fourth-generation languages such as Neuron Data, Inc.'s Open Interface. These products afford more flexibility because they let developers create GUIs that run across multiple platforms, but they generate proprietary code that limits a user's ability to move to a new tool.

Finally, buyers should look closely at the internals of GUI builders. One tool may have spreadsheet functionality embedded in a screen widget that can be launched from the GUI, while another does not, Adams says. Presentation strengths of various GUIs should also be measured by placing them side by side, but experts warn that comparing widget functions can be confusing.

Cross-platform capabilities should also be examined. GUI tools such as XVT Software, Inc.'s XVT Design and Open Interface let users mix and match GUIs across platforms. ■

Bruno is a free-lance writer in San Francisco.

GUI Builders

COMPANY	PRODUCT	PRICE
Alsys *Burlington, Mass.*	**TeleUse**	**$7,500**
Imperial Software Technology, resold by DataViews *Northampton, Mass.*	**Xdesigner**	**$3,500**
Integrated Computer Solutions *Cambridge, Mass.*	**Builder Xcessory**	**$3,200**
Neuron Data *Palo Alto, Calif.*	**Open Interface**	**$7,500 - $15,000**
Powersoft *Burlington, Mass.*	**PowerBuilder**	**$3,395**
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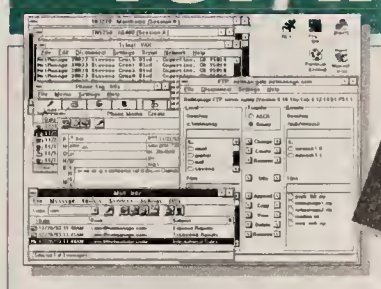

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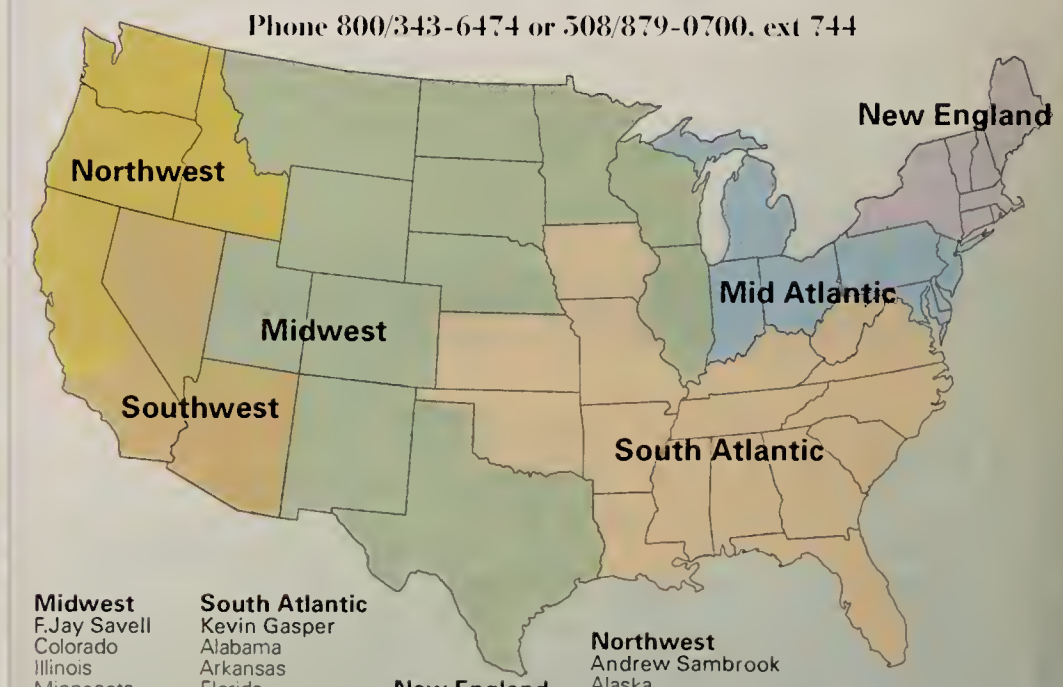

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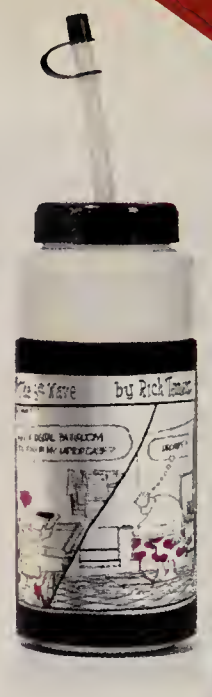

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Stratacom Inc.	11.2
Platinum Technology	11.1
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Ask Computer Systems	9.4
Intergraph Corp.	6.7
Convex Computer	6.7

Dollar

Matsushita Electronics	5.75
Bellsouth Corp.	3.13
Bell Atlantic Corp.(L)	2.75
Powersoft	2.50
AMERITECH Corp.	2.13
Stratacom Inc.	2.13
Nynex Corp.	1.63
Southwestern Bell Corp.	1.50

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Percent

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Kendall Square Research	-21.9
Digital Equipment Corp.	-17.0
Western Digital Corp.	-16.5
Walker Interactive Systems	-15.8
Ganoalf Technologies Inc.	-15.5
Motorola Inc.	-15.4
Chips and Technologies	-15.2

Dollar

Motorola Inc.	-16.38
Micron Technology(H)	-10.88
Texas Instruments	-9.50
Cabletron Systems	-8.88
Intel Corp.	-8.38
Compaq Computer Corp.(H)	-6.88
3 COM Corp.	-6.13
Digital Equipment Corp.	-4.88

Tech stocks' general woes were compounded by news of Microsoft Corp.'s parting with Sybase, Inc. and by poor earnings reports from SynOptics Communications, Inc. and Motorola, Inc. (see page 39).

Industry Almanac

Is it safe?

High-tech stocks have been trampled for several weeks. We asked analysts what they expect from computer stocks over the next month.

Terence Quinn
Managing director, Furman Selz, Inc.

"I'm not a prognosticator for the general market, but it probably isn't over yet. It has to do with the perception of interest rates and whether they will continue to rise. Also, the equity market is working in lockstep with the bond market, so until that uncouples a bit.

"[Investors] are throwing everything out, not just the stocks with the high price/earnings ratios. There are some enterprise software stocks that have had very reasonable valuations, like Computer Associates, Legent, BMC Software — even a relational database company like Informix; they're all getting creamed at the same rate and the same magnitude as Powersoft and the others with high multiples.

"The only ones that have been somewhat stable — a flight to safety, you might say — have been the services companies. First Data Corp., EDS, Automatic Data Processing and First Financial Management have been much more stable than other tech stocks.

"Most people who follow the software group are hiding under their desks right now."

Charles Ronson
Money manager, Balestra Capital

"This isn't a true bear market. The market's more likely to go sideways for a while.

"As far as the tech stocks being knocked down, first of all, they do take their lead from the big ones: Motorola, Apple, Intel, Novell. Some of those were actually doing quite well. Microsoft hit 90, Motorola hit 100. Then they backed off because the news didn't support the speculation. Certainly the market is looking for reasons to withdraw support from stocks, which is a sign of a correction.

"On the IPO front, things won't keep up with February's pace. But there is still money that is quite willing to bid maniacally for certain tech ideas. For example, Integrated Silicon Systems went out at 15 and has almost doubled. Money is still looking around for the hot idea du jour, and if you show it to them, they will act as ridiculously as they did last year."

Compiled by Derek Slater.

Exch	52-Week Range			Apr. 15 3PM	Wk Net Change	Wk Pct Change
Communications and Network Services						**OFF 3.42%**
OTC	63.75	19.63	3 COM Corp.	52.25	-6.13	-10.5
NYS	45.56	35.50	AMERITECH Corp.	38.63	2.13	5.8
NYS	65.00	49.63	AT&T (L)	50.00	0.00	0.0
OTC	26.50	12.50	Banyan Systems Inc.	17.00	-1.00	-5.6
NYS	69.13	49.00	Bell Atlantic Corp. (L)	52.00	2.75	5.6
NYS	63.88	50.63	Bellsouth Corp.	58.63	3.13	5.6
NYS	21.50	4.25	Bolt, Beranek & Newman	14.50	-0.63	-4.1
OTC	15.75	9.50	Brooktrout Technology	15.25	0.75	5.2
NYS	132.50	79.50	Cabletron Systems	103.88	-8.88	-7.9
OTC	43.00	15.25	Centigram Communications	34.50	-2.25	-6.1
OTC	60.25	28.75	Chipcom Corp.	49.38	-2.88	-5.5
OTC	40.75	19.38	Cisco Systems Inc.	31.50	-2.50	-7.4
OTC	18.38	8.00	Compression Labs Inc.	9.88	-1.75	-15.1
OTC	12.38	4.88	Computer Network Tech.	9.13	-0.38	-3.9
OTC	36.00	10.50	CrossComm	10.50	-3.38	-24.3
OTC	4.06	1.50	Data Switch Corp.	2.00	-0.13	-5.9
OTC	6.75	2.25	Digital Systems Int'l Inc.	2.88	0.50	21.1
OTC	73.13	29.50	DSC Communications	52.75	-1.75	-3.2
OTC	3.59	0.81	Gandalf Technologies Inc.	1.11	-0.20	-15.5
OTC	1.38	0.69	Gateway Communications	0.75	-0.06	-7.7
NYS	17.63	8.00	General Datacomm Inds.	12.38	-0.25	-2.0
ASE	3.13	1.75	Go Video	2.06	-0.25	-10.8
NYS	39.88	29.63	GTE Corp. (L)	30.00	0.13	0.4
NYS	95.97	72.25	ITT Corp.	86.50	-1.63	-1.8
OTC	29.88	21.50	MCI Commmunications Corp. (L)	22.13	0.19	0.9
OTC	7.75	1.50	Microcom Inc.	6.13	0.00	0.0
OTC	7.25	3.50	Netrix Corp.	6.00	-0.25	-4.0
OTC	11.75	5.75	Network Computing Devices	6.25	-0.25	-3.8
NYS	11.13	5.38	Network Equipment Tech.	8.75	-0.63	-6.7
OTC	23.38	8.00	Network General	17.63	-1.75	-9.0
OTC	10.13	6.88	Network Systems Corp.	7.25	-0.38	-4.9
OTC	73.88	28.19	Newbridge Networks Corp.	51.38	-4.63	-8.3
NYS	38.63	21.38	Northern Telecom Ltd.	28.25	-0.25	-0.9
OTC	33.50	16.00	Novell Inc.	16.00	-1.13	-6.6
NYS	48.88	33.25	Nynex Corp.	35.50	1.63	4.8
OTC	30.00	19.25	Octel Communications Corp.	22.50	-1.75	-7.2
OTC	18.25	8.75	Optical Data Systems Inc.	16.50	-0.25	-1.5
OTC	7.50	3.75	Penril Data Comm Networks	5.38	-0.88	-14.0
OTC	27.25	11.63	Picturetel Corp. (L)	11.63	-0.88	-7.0
OTC	8.25	3.63	Proteon Inc.	5.75	-0.50	-8.0
NYS	38.88	23.25	Scientific Atlanta Inc.	25.63	-1.88	-6.8
NYS	47.00	36.75	Southwestern Bell Corp.	41.00	1.50	3.8
NYS	40.25	29.63	Sprint Corp.	35.00	0.38	1.1
OTC	26.75	13.00	Standard Microsystems Corp.	16.25	-1.88	-10.3
OTC	21.13	10.50	Stratacom Inc.	21.13	2.13	11.2
OTC	42.75	19.25	Synoptics Communications	20.25	0.00	0.0
OTC	15.25	2.88	Telebit Corp.	12.25	0.75	6.5
OTC	46.00	18.50	US Robotics	31.88	-0.88	-2.7
NYS	50.75	38.50	U S West Inc.	40.50	0.00	0.0
OTC	87.75	38.50	Wellfleet Communications	70.00	0.38	0.5
OTC	28.25	8.25	Xircom	22.88	-1.63	-6.6
OTC	30.00	15.00	Xyplex Inc. (L)	16.25	-0.75	-4.4
PCs and Workstations						**OFF 4.57%**
OTC	7.50	2.50	Advanced Logic Research	6.50	0.88	15.6
OTC	59.13	22.00	Apple Computer Inc.	30.25	-3.00	-9.0
OTC	33.00	12.75	AST Research Inc.	19.25	-2.00	-9.4
NYS	5.00	0.50	Commodore Int'l	0.88	-0.13	-12.5
NYS	105.63	43.13	Compaq Computer Corp. (H)	97.13	-6.88	-6.6
OTC	34.38	13.50	Dell Computer Corp.	27.13	-1.75	-6.1
OTC	25.00	16.75	Gateway 2000 Inc.	18.13	-0.88	-4.6
NYS	93.63	64.38	Hewlett Packard Co.	78.25	-3.38	-4.1
NYS	26.88	13.06	Silicon Graphics	21.88	-1.88	-7.9
OTC	32.63	21.13	Sun Microsystems Inc.	22.50	-2.25	-9.1
NYS	50.75	28.13	Tandy Corp.	33.00	-0.38	-1.1
OTC	5.13	2.50	Zeos International Ltd.	3.00	0.00	0.0
Large Systems						**OFF 4.10%**
ASE	7.38	4.38	Amdahl Corp.	6.75	-0.13	-1.8
NYS	7.63	3.63	Convex Computer	6.00	0.38	6.7
OTC	4.50	1.88	Cray Computer	1.88	-0.13	-6.3
NYS	33.75	20.38	Cray Research Inc.	25.88	-2.38	-8.4
NYS	11.88	7.13	Data General Corp.	7.25	-0.25	-3.3
NYS	48.25	23.75	Digital Equipment Corp.	23.75	-4.88	-17.0
NYS	52.25	33.88	Harris Corp.	43.88	-0.13	-0.3
NYS	60.00	40.63	IBM	53.38	0.88	1.7
OTC	25.75	3.13	Kendall Square Research	3.13	-0.88	-21.9
NYS	175.88	113.91	Matsushita Electronics	166.50	5.75	3.6
OTC	18.75	12.25	NetFrame (L)	14.00	-1.00	-6.7
OTC	26.00	6.38	Parallan Computer	7.00	-0.25	-3.4
OTC	23.25	6.88	Pyramid Technology	8.00	-0.25	-3.0
OTC	23.25	11.25	Sequent Computer Sys.	12.75	-1.25	-8.9
OTC	6.84	1.75	Sequoia Systems Inc.	5.41	0.28	5.5
NYS	41.25	20.25	Stratus Computer Inc.	24.75	-1.00	-3.9
NYS	16.38	8.50	Tandem Computers Inc.	13.75	-1.00	-6.8
OTC	30.00	12.25	TriCord Systems (L)	13.25	-0.25	-1.9
NYS	16.50	9.88	Unisys Corp.	14.25	-0.25	-1.7
Software						**OFF 4.11%**
OTC	37.00	16.25	Adobe Systems Inc.	24.25	0.19	0.8
OTC	34.50	13.50	Aldus Corp.	26.63	-0.13	-0.5
OTC	8.88	5.00	American Software Inc.	5.25	-0.38	-6.7
OTC	15.75	6.75	Ask Computer Systems	8.75	0.75	9.4
OTC	61.75	37.00	Autodesk Inc.	55.13	-3.67	-6.2
OTC	4.50	2.25	Bachman Info. Systems	2.25	-0.25	-10.0
OTC	38.75	21.00	BGS Systems Inc. (L)	21.00	-3.31	-13.6
OTC	71.00	42.00	BMC Software Inc.	63.25	-1.38	-2.1
OTC	28.25	20.38	Boole & Babbage	24.00	0.75	3.2
OTC	27.25	12.00	Borland Int'l Inc.	13.13	-0.13	-0.9
OTC	4.63	2.75	CE Software	3.25	-0.38	-10.3
ASE	30.34	13.25	Cheyenne Software Inc.	23.25	-2.88	-11.0
OTC	14.25	6.13	Cognos Inc.	12.38	-0.38	-2.9
NYS	44.88	21.88	Computer Associates	30.38	-1.88	-5.8
NYS	5.38	2.13	Computervision Corp.	4.13	-0.13	-2.9
OTC	48.25	21.00	Compuware Corp. (H)	42.13	-1.63	-3.7
OTC	12.75	5.75	Comshare Inc.	11.00	0.00	0.0
OTC	22.00	6.81	Corel Corp.	18.88	-1.50	-7.4
OTC	8.25	3.38	Easel Corp.	4.88	-0.38	-7.1
OTC	29.25	9.25	Filenet Corp.	24.50	-0.81	-3.2
OTC	25.00	6.50	4th Dimension	7.75	0.38	5.1
OTC	12.50	5.25	Frame Technology (H)	11.13	-0.63	-5.3
OTC	13.50	7.00	Group I Software	7.50	-0.75	-9.1
OTC	31.75	13.50	Gupta	25.75	-3.50	-12.0
OTC	12.00	7.00	Hogan Systems Inc.	10.50	1.00	10.5
OTC	29.50	12.00	IMRS	25.50	0.25	1.0
OTC	44.75	12.50	Information Resources	14.00	-1.50	-9.7
OTC	27.25	13.38	Informix Corp.	20.00	-0.88	-4.2
OTC	12.38	8.50	Intergraph Corp.	10.00	0.63	6.7
OTC	9.38	4.88	Interleaf Inc.	6.75	-0.25	-3.6

Exch	52-Week Range			Apr. 15 3PM	Wk Net Change	Wk Pct Change
OTC	15.50	4.75	Intersolv Inc.	12.75	-1.75	-12.1
OTC	18.75	7.75	Knowledgeware Inc.	12.00	-1.00	-7.7
OTC	40.50	15.50	Legent Corp.	27.00	1.50	5.9
OTC	86.50	23.50	Lotus Development	66.25	-3.63	-5.2
OTC	19.25	11.50	Magic Software Enterprises (L)	12.25	0.00	0.0
OTC	11.75	4.00	MathSoft (L)	4.13	-0.38	-8.3
OTC	11.25	4.50	McAfee Associates	7.75	-1.00	-11.4
OTC	17.25	7.88	Mentor Graphics	13.25	-1.50	-10.2
OTC	37.50	12.88	Micro Focus (L)	13.00	-0.75	-5.5
OTC	11.63	4.63	Micrografx Inc.	7.13	-0.50	-6.6
OTC	98.00	70.38	Microsoft Corp.	85.25	-2.00	-2.3
OTC	37.75	15.88	Oracle Corp.	30.25	-2.06	-6.4
OTC	44.75	22.50	Parametric Technology	27.50	-0.50	-1.8
OTC	41.38	26.00	Peoplesoft	32.06	-2.69	-7.7
OTC	6.25	3.50	Phoenix Technologies	5.13	-0.38	-6.8
OTC	69.50	22.00	Powersoft	57.50	2.50	4.5
OTC	39.75	9.50	Platinum Software	9.75	-0.75	-7.1
OTC	16.75	7.25	Platinum Technology	13.75	1.38	11.1
OTC	60.25	32.25	Progress Software Corp.	45.25	-4.00	-8.1
OTC	4.09	1.94	Quarterdeck Office Sys.	2.69	-0.19	-6.5
OTC	32.00	15.25	Rainbow Technologies Inc.	16.00	-1.25	-7.2
OTC	11.38	4.88	Rasterops	5.00	-0.50	-9.1
OTC	14.50	4.50	Ross Systems	5.50	0.00	0.0
OTC	28.75	11.00	Sapiens Intl. Corp. N.V.	11.25	-0.50	-4.3
OTC	14.00	9.75	Softkey International Inc.	10.88	0.25	2.4
OTC	8.75	5.50	Software Publishing Corp.	5.50	-0.38	-6.4
OTC	17.25	7.00	Software Toolworks Inc.	14.38	0.00	0.0
OTC	13.75	6.25	State of the Art	6.75	-1.00	-12.9
NYS	35.63	17.63	Sterling Software Inc.	29.25	0.38	1.3
OTC	21.63	12.00	Struct. Dynamics Research	12.63	-0.88	-6.5
OTC	51.25	25.75	Sybase Inc.	45.25	-3.06	-6.3
OTC	20.50	10.88	Symantec Corp.	16.06	-0.19	-1.2
OTC	52.75	31.75	SynOpsys	40.75	-3.75	-8.4
OTC	24.25	11.75	System Software Assoc.	15.50	0.81	5.5
OTC	6.75	2.88	Trinzic Corp.	4.38	-0.38	-7.9
OTC	30.00	13.50	ViewLogic Systems	26.75	-0.75	-2.7
OTC	13.25	5.50	Walker Interactive Systems	8.00	-1.50	-15.8
OTC	60.00	12.75	Wall Data Inc.	37.00	-2.50	-6.3
Semiconductors						**OFF 9.11%**
NYS	32.88	16.75	Advanced Micro Devices	24.25	-3.50	-12.6
NYS	31.13	17.13	Analog Devices Inc.	26.25	-2.75	-9.5
OTC	25.31	9.38	Atmel Corp. (H)	22.63	-1.25	-5.2
OTC	7.50	2.75	Chips and Technologies	4.88	-0.88	-15.2
OTC	44.63	13.00	Cirrus Logic	34.00	-2.00	-5.6
NYS	19.88	9.63	Cypress Semiconductor Corp.	15.13	-1.38	-8.3
NYS	20.00	11.75	Dallas Semiconductor	17.38	-0.13	-0.7
OTC	74.50	42.75	Intel Corp.	60.25	-8.38	-12.2
NYS	23.00	10.50	LSI Logic Corp.	18.25	-2.25	-11.0
OTC	26.75	12.25	Lattice Semiconductor	16.50	-1.00	-5.7
NYS	99.75	19.38	Micron Technology (H)	83.75	-10.88	-11.5
NYS	109.75	68.63	Motorola Inc.	90.13	-16.38	-15.4
NYS	25.00	12.00	National Semiconductor	18.75	-2.50	-11.8
OTC	11.50	6.50	Sierra Semiconductor	7.50	-0.88	-10.4
NYS	89.50	51.63	Texas Instruments	70.00	-9.50	-11.9
OTC	18.88	6.50	VLSI Technology	12.75	-1.63	-11.3
OTC	14.38	5.13	Weitek	6.13	0.13	2.1
ASE	20.38	3.63	Western Digital Corp.	14.50	-2.88	-16.5
OTC	59.75	29.75	Xilinx	49.25	-1.75	-3.4
OTC	40.75	22.00	Zilog Inc.	31.25	-2.00	-6.0
Peripherals and Subsystems						**OFF 4.45%**
OTC	30.50	12.25	American Power Conversion	23.38	-1.63	-6.5
OTC	24.75	16.75	Banctec Inc.	22.00	0.00	0.0
OTC	9.00	3.50	Cambex Corp.	3.75	-0.25	-6.3
ASE	8.25	3.63	Cognitronics Corp.	3.63	-0.38	-9.4
NYS	20.50	9.00	Conner Peripherals	15.38	0.75	5.1
OTC	39.25	17.50	Creative Technologies Inc.	23.00	-0.75	-3.2
OTC	25.00	6.50	Data Race Inc.	8.25	-0.25	-2.9
ASE	11.63	4.75	Dataram Corp.	5.00	-0.13	-2.4
NYS	23.00	6.16	EMC Corp.	18.50	-1.75	-8.6
OTC	8.25	3.13	Emulex Corp.	3.63	-0.25	-6.5
OTC	21.00	14.25	Evans & Sutherland	17.38	-1.63	-8.6
OTC	22.50	7.50	Exabyte	19.00	-0.75	-3.8
OTC	34.00	7.50	Intelligent Info. Systems	8.25	-0.25	-2.9
OTC	5.13	2.25	Iomega Corp.	2.44	-0.13	-4.9
OTC	9.75	5.75	IPL Systems Inc.	6.75	-0.75	-10.0
OTC	28.50	13.75	Komag Inc.	21.95	-2.55	-10.4
OTC	8.63	4.38	Maxtor Corp.	7.13	-0.25	-3.4
OTC	8.75	4.88	Micropolis Corp.	7.00	-1.13	-13.8
NYS	58.50	48.88	3M Corp	49.00	-1.50	-3.0
OTC	9.50	6.25	Printronix Inc.	7.75	-1.00	-11.4
NYS	17.25	7.50	QMS Inc.	7.88	-0.25	-3.1
OTC	20.25	9.38	Quantum Corp.	15.44	-0.69	-4.3
OTC	9.13	3.13	Radius Inc.	7.63	0.13	1.7
NYS	17.75	11.63	Recognition International	13.75	0.13	0.9
OTC	6.88	3.63	Rexon Inc.	6.13	-0.38	-5.8
OTC	28.75	13.75	Seagate Technology	23.69	-0.44	-1.8
NYS	45.00	23.75	Storage Technology	29.38	-1.00	-3.3
NYS	32.63	21.38	Tektronix Inc.	32.13	0.50	1.6
NYS	104.88	69.88	Xerox Corp. (H)	98.75	-2.25	-2.2
Services						**OFF 3.54%**
OTC	23.38	14.88	American Mgmt. Systems	20.50	-0.13	-0.6
NYS	4.25	2.38	Anacomp Inc.	3.75	-0.13	-3.2
OTC	23.50	14.50	Analysts Int'l	16.00	-0.25	-1.5
NYS	56.88	46.88	Auto Data Processing	51.00	-0.75	-1.4
OTC	18.25	7.50	Cambridge Tech. Partners	14.75	0.00	0.0
NYS	23.88	13.00	Ceridian Corp.	22.38	-0.25	-1.1
NYS	24.25	13.88	Comdisco Inc.	20.00	-1.75	-8.0
OTC	12.50	4.66	Computer Horizons	10.75	0.25	2.4
NYS	41.75	23.34	Computer Sciences	36.63	-1.63	-4.2
NYS	8.75	6.00	Computer Task Group	7.75	-0.13	-1.6
NYS	35.00	17.38	CompUSA Inc.	18.25	-1.88	-9.3
OTC	13.88	7.75	Control Data Systems Inc.	7.75	-0.50	-6.1
OTC	11.00	6.63	Egghead Discount Software	8.25	-0.38	-4.3
NYS	36.88	26.00	General Motors E (EDS)	35.25	-0.25	-0.7
OTC	22.75	12.75	Inacom Corp.	13.88	-2.38	-14.6
OTC	28.00	12.00	Intelligent Electronics	21.75	-3.25	-13.0
OTC	22.50	9.75	Merisel	17.25	-1.25	-6.8
OTC	32.50	8.16	Microage Inc.	22.25	-1.75	-7.3
OTC	40.50	23.84	Paychex	34.50	-1.00	-2.8
NYS	47.00	21.63	Policy Management Sys.	29.00	0.13	0.4
NYS	24.88	16.00	Reynolds and Reynolds	21.88	-0.38	-1.7
OTC	28.50	14.00	SEI Corp.	23.75	-0.25	-1 0
OTC	29.38	17.50	Shared Medical Systems	27.38	-0.38	-1.4
OTC	12.63	5.63	SHL Systemhouse	6.88	-0.44	-6.0
OTC	30.75	13.50	Software Spectrum Inc.	15.25	0.50	3.4
OTC	42.75	28.00	Sungard Data Systems	35.25	-0.50	-1.4

KEY: (H) = New annual high reached in period (L) = New annual low reached in period
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The first books and films available on the info highway include the following

Books:

The Bridges and Routers of Madison County
The Information Highway Less Traveled
Women Who Run with the Daemons
Lord of the Token Ring

Films:

Remains of the SNA
Like Chocolate for Hackers
The Keyboard
Die Hard Disk 2

Source: "The Smith & Shows Letter," April 1994

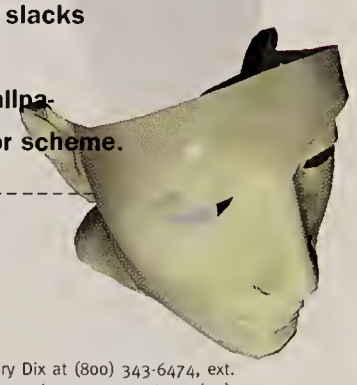
Sue the beast!

A **mechanical monster**, designed to frighten tourists, flipped out and injured a set designer working on it, according to town officials in Land's End, England. The hydraulic-powered beast went out of control because of a temporary fault in its computer program. It held the designer in its jaws for nearly a minute until his colleagues freed him.

Source: *Chicago Sun-Times*, March 31

Thought for the day

Ever achieve Nerdvana? That's the blissful state in which your tie and slacks match your Windows wallpaper and color scheme.



Great Names

Holly Hunter

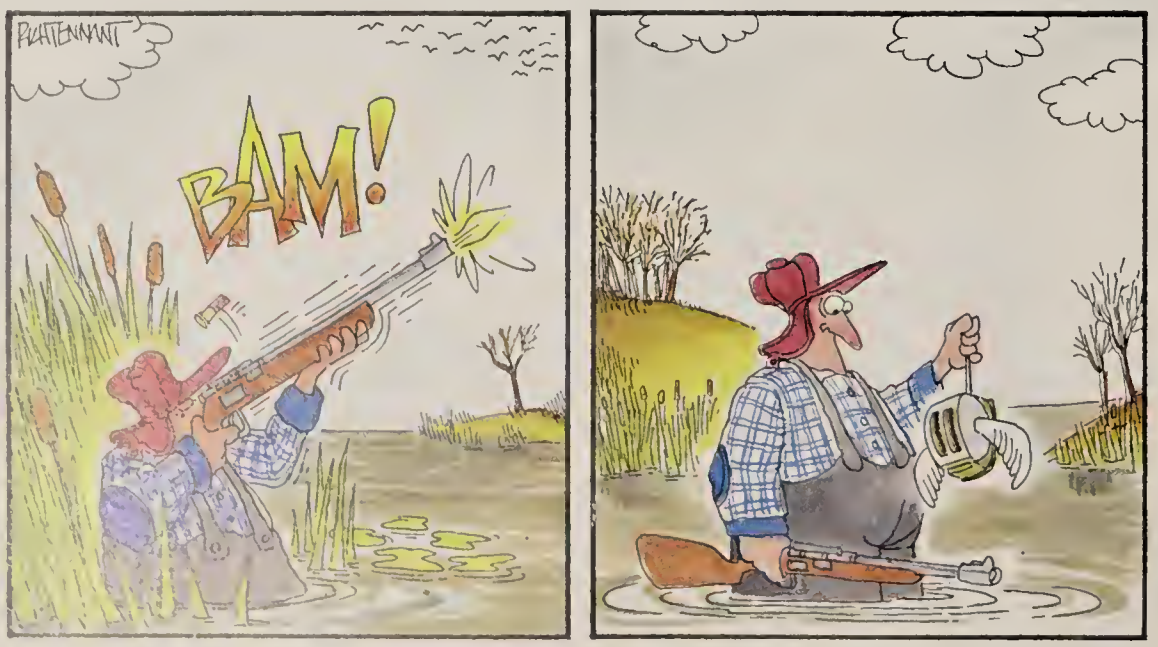
Cunningham Communication, Inc.

A computer industry public relations firm in Santa Clara, Calif.

What (humorous) spring cleaning advice would you give your vendors? Contact Lory Dix at (800) 343-6474, ext. 236 or CompuServe 76537,2413. If we use your idea, we'll send you a gift (but please leave a contact number).

Compiled by Lory Dix.; design by Jose E. Bruzual

The 5th Wave *by* Rich Tennant



Inside Lines

Apple tries to blaze a trail . . .

Apple will take PowerPC where no Macintosh has gone before — the heart of the enterprise — when it announces a new client/server strategy next week. The company is expected to announce three PowerPC 601-based servers and that it is working with Novell to port Processor-Independent NetWare to PowerPC.

. . . Compaq won't be on it . . .

Sources at Compaq and Apple confirmed that talks between the two are dead, except for the server side of the business. Compaq has no capacity to manufacture Apple's desktops, no interest in building its own PowerPC desktop in 1994 and absolutely no interest in the Mac OS, an internal source said. On the server side, however, Compaq reportedly has a definite interest in playing, particularly when the PowerPC 604 chip becomes available.

. . . but Acer may be right up front

The Apple/IBM/Motorola PowerPC consortium appears to have landed Acer as a customer, but Acer refuses to comment despite comments by one of its officials. David Tanner, UK marketing manager for Acer, was quoted at length in the Internet newsletter "PowerPC News" (to subscribe, message add@power.globalnews.com), talking about a second-quarter unveiling of a motherboard with joint PowerPC/Pentium support. Acer's official comment was "no comment."

Legent launches middleware

Legent will launch today the middleware layer of its systems management framework, Cross Platform Environment (XPE). Called Xpertware, the middleware provides messaging APIs and management services that allow applications that are XPE-enabled to interoperate. Legent announced XPE late last year as a systems management strategy for distributed computing.

Lost in cyberspace?

It was recently reported that astronomer Carl Sagan, who protested the use of his name as a secret code word for an Apple computer model, is now suing Apple after discovering that the code word was changed to BHA (for Butt Head Astronomer).

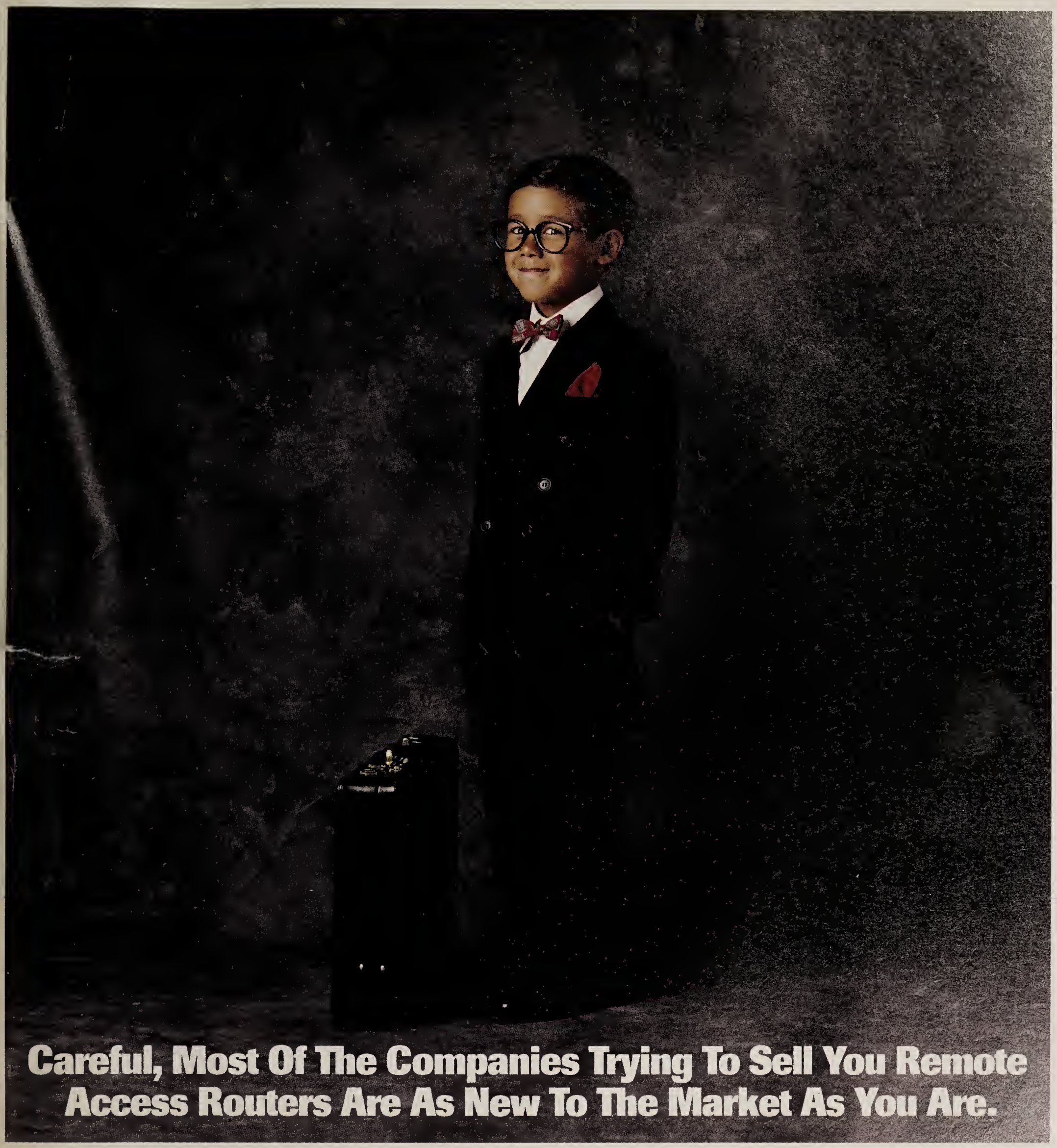
Now that's speedy

Development of the first 100VG-AnyLan silicon is so far ahead of schedule that AT&T now expects to release the 100M bit/sec. chip set to developers in volume in July instead of the fourth quarter, sources said. This means 100VG-AnyLan products will come to market roughly three months earlier than expected. For example, Hewlett-Packard said it will ship 100VG-AnyLan hubs for its AdvanceStack family in August for roughly $500 per port.

Interface on ice

The Desktop Management Task Force this week will announce real progress toward standardized management of desktop hardware and software: a "frozen" version of its Desktop Management Interface (DMI) due in July and the formation next month of a working group to address application management. The group will start working on DMI-based specs for application management.

The Boston-based Computer Museum is hosting a high-tech charity auction, conducted in real time through E-mail via the Internet, to benefit its educational programs. The 24-hour-a-day auction begins at 10 a.m. on April 22 and ends at 8 p.m. on April 29. Up for bid will be more than 70 eclectic items, donated largely by industry leaders and including an assortment of early computing products and memorabilia starting as low as $5. To participate, preregister at any time by sending E-mail to auction-info@auction.tem.org. To auction off a few ideas to Computerworld *about news items or tips, call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News Editor Maryfran Johnson can be reached by phone at (508) 820-8179, via the Internet at mjohnson@cw.com or through MCI Mail at 590-8017.*



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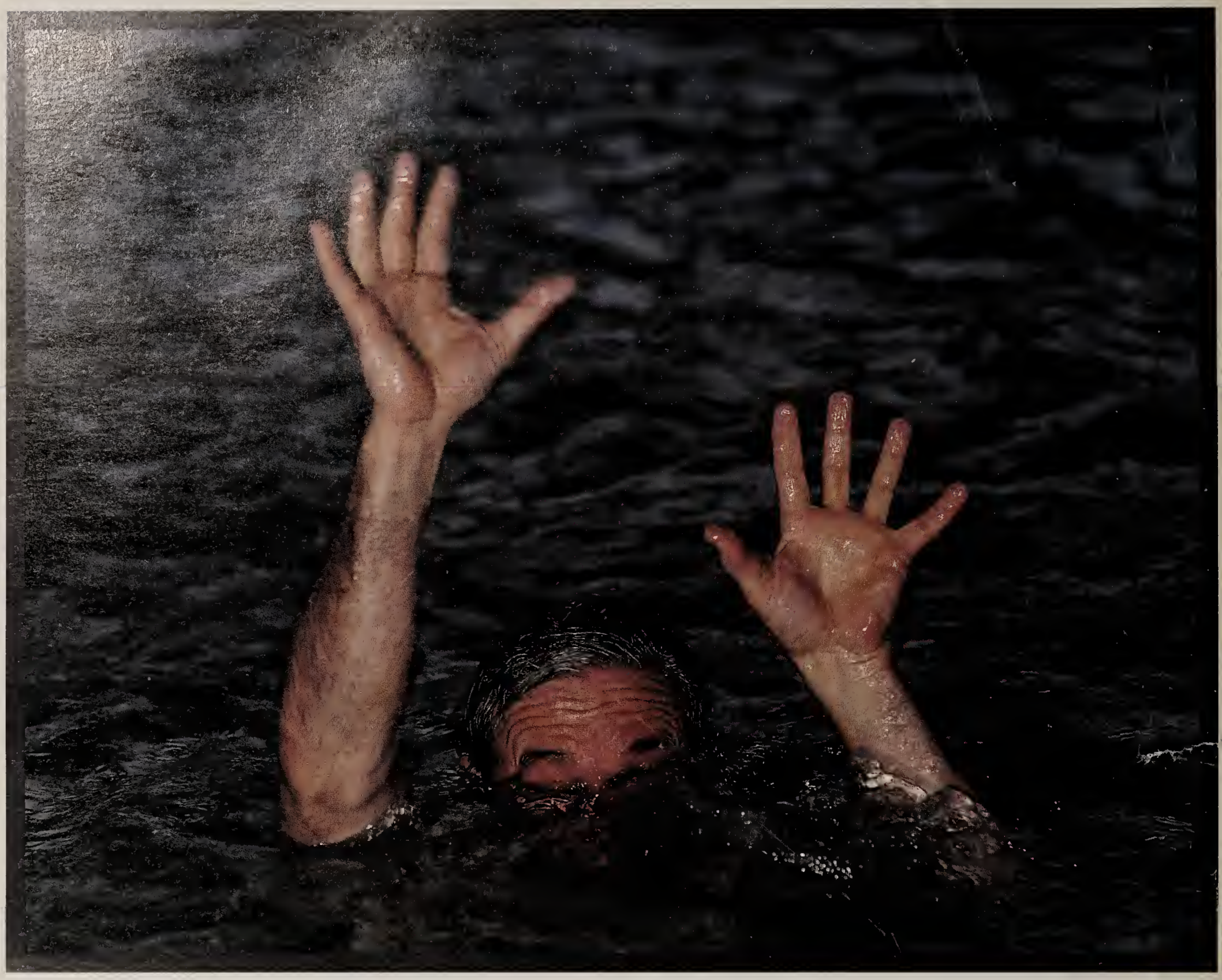

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